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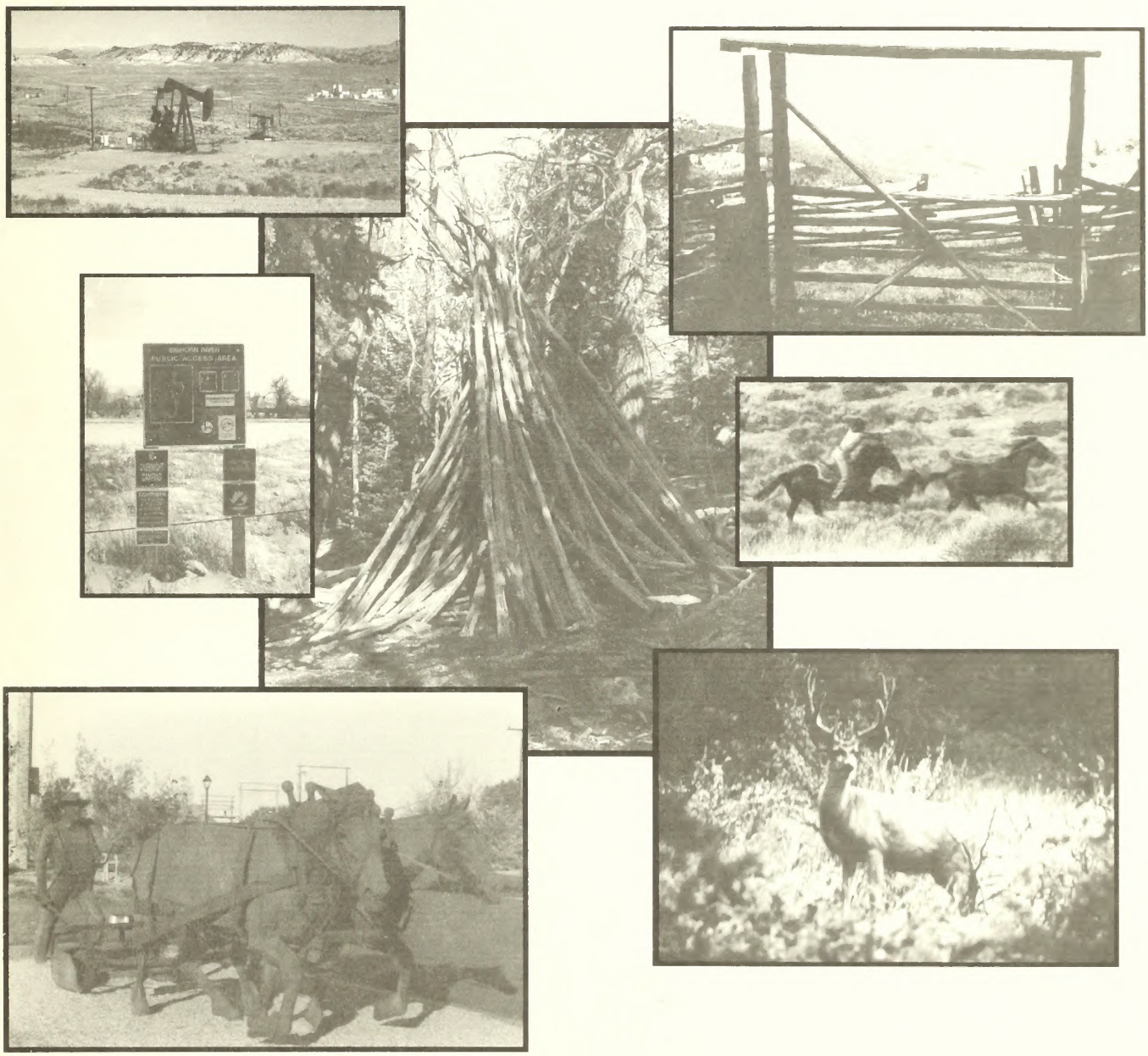
Grass Creek Resource Area Resource Management Plan Draft Environmental Impact Statement



The Bureau of Land Management is responsible for the balanced management of the public lands and resources and their various values so that they are considered in a combination that will best serve the needs of the American people. Management is based upon the principles of multiple use and sustained yield; a combination of uses that take into account the long term needs of future generations for renewable and nonrenewable resources. These resources include recreation, range, timber, minerals, watershed, fish and wildlife, wilderness and natural, scenic, scientific and cultural values.

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United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Wyoming State Office
P.O. Box 1828
Cheyenne, Wyoming 82003-1828

Dear Reader:

This Draft Environmental Impact Statement for the Grass Creek Resource Management Plan outlines four alternatives for managing the public lands and resources in the Grass Creek Resource Area of the Bureau of Land Management. These alternatives are designed to resolve resource management issues that were identified with public involvement during the planning process. This document also describes the anticipated environmental consequences of implementing each alternative.

Your comments are invited on the alternatives and the descriptions of environmental consequences. A 90-day comment period will begin when a notice of the draft EIS appears in the *Federal Register*. (This notice is filed by the Environmental Protection Agency.)

Please send your written comments to Bob Ross, Team Leader, P.O. Box 119, Worland, Wyoming 82401-0119.

Comments will be considered and evaluated in the development of a final EIS, which should be available for your review within a year.

For the development of this Resource Management Plan, the University of Wyoming is conducting an analysis of socioeconomic impacts. The preliminary findings of this analysis are published in the attached EIS. This study considers existing and foreseeable production levels in the planning area (as shown in Table 15.) We are looking forward to your comments on these socioeconomic impacts. Based on your responses, the study will be revised as necessary and published in the final EIS.

With your participation, we hope to move forward toward improved public land management in the Grass Creek Resource Area.

Sincerely,

Robert A. Bennett
Acting State Director

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DRAFT

RESOURCE MANAGEMENT PLAN
and
ENVIRONMENTAL IMPACT STATEMENT
for the
Grass Creek Resource Area
Worland District, Wyoming

Prepared by:

U.S. Department of the Interior
Bureau of Land Management
Worland, Wyoming

1994

Robert A. Bennett
Acting State Director, Wyoming

Date 9/26/94

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SUMMARY

INTRODUCTION

This draft environmental impact statement (EIS) for the Grass Creek Resource Management Plan (RMP) describes and analyzes future management options for approximately 968,000 acres of public land surface and 1,171,000 acres of federal mineral estate administered by the Bureau of Land Management (BLM) through its Grass Creek Resource Area in Worland, Wyoming. The Grass Creek Resource Area encompasses parts of Big Horn, Hot Springs, Park, and Washakie counties in north central Wyoming (Map 1).

When completed, the Grass Creek RMP will provide a framework for managing the public lands and resources and allocating their uses in the resource area. Specifically, this RMP EIS is focused on resolving three key resource management issues: vegetation management (how should vegetation be managed to protect water quality, soil productivity, and habitat, while also being managed for uses like livestock grazing and off-road vehicle (ORV) driving which remove vegetation?); special management area designations (what areas warrant special management emphasis because of their important, rare, or fragile resources and processes?); and resource accessibility and manageability (how can public lands and resources be managed to allow for appropriate types and levels of use, and to provide protection as needed?).

ALTERNATIVES

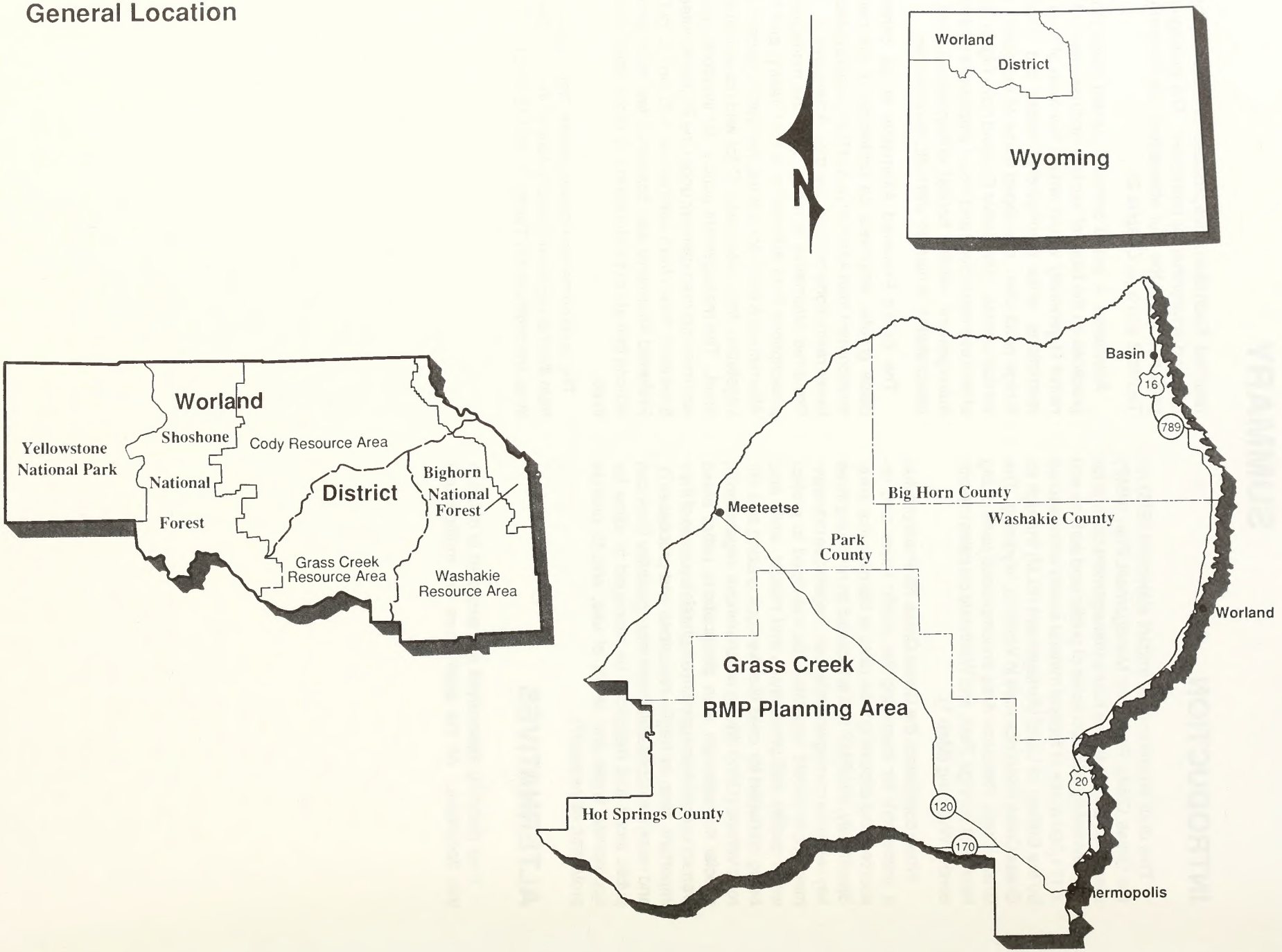
Four planning alternatives are analyzed in detail in this document. All the alternatives are multiple-use oriented. Each alternative provides for resource production and environmental protection. The management prescriptions of the four alternatives are compared in Tables 2 and 3 (in Chapter 2).

Alternative A would continue current management practices on the basis of existing land use plans. Alternative B generally would reduce the level of land use restrictions, while emphasizing timber and livestock forage production, developed forms of recreation, and vehicle access. Alternative C would have higher levels of land use restrictions and would emphasize wild horse management, wildlife habitat enhancement, and the interpretation of historic and cultural resources.

The BLM's Preferred Alternative would generally place greater emphasis on protection of the natural environment than Alternative A or B and would prescribe fewer restrictions on land use than Alternative C. The Preferred Alternative is made up of the management prescriptions from Alternative A for forestry; and from Alternatives A and C for cultural, recreation, access, and vegetation; from Alternative C for wild horse management. The management actions for livestock grazing and minerals management under the Preferred Alternatives were drawn from Alternatives A, B, and C, but the Preferred Alternative also contains a few management actions that are not included in any of the other alternatives.

The environmental consequences that could result from the management prescriptions of the four alternatives are compared in Tables 15 and 16 (in Chapter 4).

Map 1
General Location



ABBREVIATIONS

ACEC	Area of Critical Environmental Concern
APHIS	Animal and Plant Health Inspection Service, U.S. Department of Agriculture
AUM	Animal Unit Month
BLM	Bureau of Land Management, U.S. Department of the Interior
BOR	Bureau of Reclamation, U.S. Department of the Interior
BP	Before Present
CFR	Code of Federal Regulations
CSU	Controlled Surface Use
DEQ	Department of Environmental Quality
DPC	Desired Plant Community
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
FLPMA	Federal Land Policy and Management Act of 1976
FS	Forest Service, U.S. Department of Agriculture
FWS	Fish and Wildlife Service, U.S. Department of the Interior
NEPA	National Environmental Policy Act of 1969
ORV	Off-Road Vehicle
NPS	National Park Service, U.S. Department of the Interior
NSO	No Surface Occupancy
RMP	Resource Management Plan
SRMA	Special Recreation Management Area
USDA	United States Department of Agriculture
USDI	United States Department of the Interior
VRM	Visual Resource Management
WGFD	Wyoming Game and Fish Department

CHAPTER 1

PURPOSE AND NEED

INTRODUCTION

This is a draft environmental impact statement (EIS) for a resource management plan (RMP). It will be used for the development of an RMP for the Grass Creek Resource Area in the Bureau of Land Management's (BLM's) Worland District. The RMP EIS documents the analysis of four alternative resource management plans for BLM-administered public lands (hereafter referred to as public lands) and resources. These four alternatives are analyzed in detail, and each represents a complete and reasonable resource management plan. Each alternative could be used to guide the resource management of the planning area.

Each alternative considers other federal agencies', local and state governments', and Native American tribes' land use and resource management plans, programs, and policies. When an alternative is finally selected to become the Grass Creek RMP, it will be consistent with these, to the maximum extent practical.

An RMP is developed, maintained, and amended by a planning process which is based on section 102(c) of the National Environmental Policy Act of 1969 (NEPA), and implements section 202 of the Federal Land Policy and Management Act of 1976 (FLPMA). The planning process is guided by BLM regulations in Title 43 of the Code of Federal Regulations, part 1600 (43 CFR 1600) and the Council on Environmental Quality regulations in 40 CFR 1500.

The BLM's planning is conducted in three steps. For the Grass Creek RMP, a BLM planning team reviewed applicable Executive Orders, laws, regulations, policies, and directives. The BLM State Director also provided specific guidance for the RMP's development. These requirements were followed in conducting the planning effort and preparing this draft EIS.

Now, with the public's help, the Grass Creek Resource Area will prescribe overall land use and resource management, serving as the general management guidance for BLM-administered public lands in the planning area. The published RMP will represent the completion of this second step.

The last step will be activity planning. Compared to the RMP, activity planning will provide more detailed analyses and decisions for implementing the RMP and addressing management concerns in smaller geographical areas, and evaluating projects on a daily basis.

After completion, the Grass Creek RMP will be kept current through minor maintenance, or through amendments and revisions, as the demands on public lands and resources change, as the land and resource conditions change, or as new information is acquired.

The purpose for developing the Grass Creek RMP is to provide needed changes in BLM's current management direction for the planning area. The current BLM land use plan for the planning area is the 1983 Grass Creek Management Framework Plan. Policy and management changes have occurred since then (including the need to comply with the National Environmental Policy Act), requiring an updated, comprehensive, and environmentally adequate management guide.

The RMP is developed through an environmental analysis process which is documented in an EIS. The RMP EIS describes the anticipated consequences of current management. It also describes alternatives to current management and their consequences. This provides the basis for developing an RMP that resolves land use and resource issues associated with current management.

Until the Grass Creek RMP is completed, daily management decisions will continue to be based on the area's Management Framework Plan. The Grass Creek RMP will supersede the management framework plan and other general planning documents for the planning area.

DESCRIPTION OF THE PLANNING AREA

The planning area for the Grass Creek RMP is in the Grass Creek Resource Area of the BLM Worland District. The planning area includes portions of Big Horn, Hot Springs, Park, and Washakie counties in northwestern Wyoming. (See Map 1. Table 1 summarizes land and mineral ownerships in the area.)

TABLE 1
LAND AND MINERAL OWNERSHIP IN THE GRASS CREEK PLANNING AREA

Areas the Grass Creek RMP Decisions WILL Cover	Approximate Acres
A. Areas where BLM administers both the federal land surface and the federal minerals under those lands.[1]	960,000
B. Areas of BLM-administered federal land surface where the minerals under those lands are owned by private individuals, the state of Wyoming, or local governments.[2]	8,000
C. Areas of BLM-administered federal minerals where the surface of those lands is owned by private individuals, the state of Wyoming, or local governments.[3]	211,000
Total BLM-administered federal land surface to be covered by RMP decisions.	**968,000**
Total BLM-administered federal minerals to be covered by RMP decisions.	**1,171,000**
Areas the Grass Creek RMP Decisions Will NOT Cover	
D. Areas where the federal land surface is administered by the Bureau of Reclamation and the federal minerals under those lands are administered by the BLM.	4,700
E. Areas where the land surface and the minerals under those lands are both owned by private individuals, the state of Wyoming, or local governments and the BLM has no administrative authority.	302,000
TOTAL SURFACE ACRES IN THE GRASS CREEK PLANNING AREA	**1,485,700**

[1]Throughout the RMP EIS, these BLM-administered federal lands will be called "public lands." According to FLPMA, sec. 103(e), "The term 'public lands' means any land and interest in land owned by the United States within the several States and administered by the Secretary of the Interior through the Bureau of Land Management, without regard to how the United States acquired ownership, except—(1) lands located on the Outer Continental Shelf; and (2) lands held for the benefit of Indians, Aleuts, and Eskimos."

[2]The surface of these lands will also be described as "public lands" in this RMP EIS, although BLM will make no planning or management decisions for the minerals.

[3]The interest in these lands administered by BLM consists of the minerals. These will not be called "public lands" in this RMP EIS but BLM's interest will be described as "BLM-administered minerals" or "BLM-administered mineral estate."

Within the planning area, there are varied and overlapping land and mineral ownerships. There are a few thousand acres of land administered by other federal agencies, and other lands and minerals owned and administered by private individuals and by local and state governments. Providing management for the surface of these lands is not within BLM's jurisdiction and, in certain instances, management of the federal minerals under these lands is not an objective of the RMP. For example, the Grass Creek RMP will not include any management decisions for withdrawn federal lands administered by the Bureau of Reclamation (BOR). Therefore, any BLM administrative responsibilities for these lands, such as grazing or mineral leasing, are handled individually and are guided by the BOR's policies, procedures, and plans and in accordance with a cooperative agreement between the two agencies.

PLANNING CRITERIA AND PLANNING ISSUES

Criteria

Guidelines were established to assist in development of the RMP EIS. These are ground rules, or planning criteria, that serve to:

– identify the scope and parameters of the RMP EIS for the interdisciplinary planning team, the BLM managers, and the public; and

– insure that planning is focused on planning issues.

Planning criteria are based on standards prescribed by laws and regulations; guidance provided by the BLM Wyoming State Director; results of consultation and

coordination with the public, other agencies and governmental entities, and Native American tribes; and analysis of information pertinent to the planning area.

The planning criteria focus on the preparation of alternatives and analysis of their effects, and guide selection of the preferred alternative.

Environmental impact statements are not intended to be encyclopedic. Therefore, this draft RMP EIS does not contain detailed background information that was used in the course of the planning effort and in developing this document. It also does not reiterate all laws, regulations, policies, standards, and guidelines used by the BLM in administering the public lands. Some examples of background information and important directives that were used are listed below and can be made available upon request.

– A Biological Assessment concerning threatened or endangered and candidate species and a list of plants and animals addressed.

– A geologic map of the planning area with text comparing geology, landforms, and vegetative communities.

– Background information used in the analysis of socioeconomic impacts

– Standards and guidelines for mitigating or avoiding adverse effects to resource values such as cultural, paleontological, wildlife, and watershed.

– Standard operating and development procedures for minerals development and other land uses.

– Vegetative treatment guidelines for the control of noxious weeds.

– Wyoming BLM Standard Mitigation Guidelines for Land and Resource Uses on BLM-Administered Public Lands.

General Criteria

The following were considered in one or more of the alternatives.

– The need for designating special management areas, such as Areas of Critical Environmental Concern (ACECs), and their potential management.

– Management of significant cultural, historic, and paleontological resources.

– The protection and enhancement of riparian areas.

– The protection of habitat for threatened, endangered, sensitive, and other important wildlife and plants.

– Whether public lands along rivers and streams are suitable for wild and scenic river designation.

– Livestock grazing practices that are compatible with other resource management objectives.

– Identification of lands suitable for minerals exploration and development, off-road vehicle (ORV) use, rights-of-way construction, and other activities that may result in surface disturbance.

– Identification of lands where rights-of-way construction and other surface disturbances would be avoided.

– Opportunities for enhancing recreation.

– Opportunities for land exchanges that could be useful in meeting goals for resource manageability and public access.

Effects Considered

The following potential effects were addressed.

– Effects of opening or closing BLM lands to development.

– Effects of surface-disturbing activities on air quality, cultural resources, recreational opportunities, watershed, and wildlife resources.

– Effects of land sales or exchanges, livestock grazing, and ORV use.

– Economic impacts of land use restrictions on livestock grazing, minerals exploration and development, recreation, and timber harvesting.

– Effects on the diversity of plant and animal species.

Selection of Preferred Alternative

Answers to the following questions guided selection of the preferred alternative.

– What restrictions are needed to protect resources and keep lands and resources available for public use?

– Before restricting development, was the potential for occurrence of energy and mineral resources considered?

– Is there consistency with land use and resource management plans, programs, and policies, of other federal agencies, state and local governments, and Native American tribes?

– Does consistency with other land use and resource management plans, programs, and policies improve the management of ecosystems that cross administrative boundaries?

– Does the preferred alternative sustain the productivity and diversity of ecosystems and provide for human values, products, and services?

Biological Diversity

Biological diversity is the variety of life and its processes. Although vastly complex, it includes some measurable distinctions like genetic differences within and among species, species variations, associations of species with each other and their environments, and the patterns and linkages of these biological communities across geographical areas. (Keystone Center 1991.)

Inventory, monitoring, research, data management, and information sharing are needed for understanding the elements of biological diversity that exist in the Grass Creek planning area. There is a need to identify biologically diverse areas and conserve their richness of plant and animal species. The FLPMA mandates inventory of the public lands and the use of inventories in management. According to the Keystone Center, BLM's multiple-use management of public lands promotes biological diversity because, under this management, a variety of ecologic stages of habitat are developed and maintained, each with its particular plant and animal community. Also, the variety of landscapes and habitat types making up the public lands provides naturally for biological diversity.

The BLM policy requires that habitats be managed with emphasis on biological communities and natural systems, to ensure self-sustaining populations and an abundance and diversity of wildlife, fish, and plant resources on the public lands; and that rare, vulnerable, and representative habitats, plant and animal communities, and natural systems be conserved. The Grass Creek RMP EIS considered the effects of the four alternatives on biological diversity by using the evaluation of habitat as a starting point.

Ecosystems and Ecosystem Management

An ecosystem is an intricate group of organisms within their environmental communities, working as an ecological unit or natural system. Plants and animals, including humans, are a part of this dynamic process of living and nonliving interaction. The BLM's mission is to efficiently manage these ecosystems.

Ecosystem management is a process that considers the total environment. It requires the skillful use of ecological, economic, social, and managerial principles in managing ecosystems to produce, restore, or sustain ecosystem integrity and desired conditions, uses, products, values, and services over the long term. Management of individual components of ecological systems for immediate needs is tempered or expanded to responsible management centered on long-term goals and objectives targeted to the entire ecological system. The principles of ecosystem management, used in BLM's day-to-day management of the public lands and resources, include recognition that people and their social and economic needs are an integral part of ecological systems. It is consistent with the BLM's mission and direction under the FLPMA and it is supported by other laws guiding the BLM's mission.

Effective ecosystem management will be incorporated into implementation of the Grass Creek RMP, into site-specific implementation plans, and into daily management decisions.

Development of Mitigation Needs

When the four alternatives in the RMP EIS were formulated, each included mitigations to protect or reduce adverse effects to resources that may be caused by surface-disturbing and other disruptive activities. These measures vary by alternative in the type or degree of protection provided. This variation in protective measures provides a basis for comparing mitigation effectiveness among the alternatives. For example, if a protective measure in one alternative is inadequate or too restrictive, the measure is modified in another alternative. The comparisons are then used to develop the mitigation needs for the Preferred Alternative.

Protective measures are applied as conditions of land and resource use: (a) to minimize soil movement; (b) to minimize disturbance of vegetation in sensitive areas such as riparian areas; (c) to protect important cultural and paleontological resources, recreational values, and wildlife resources (including threatened or endangered species); and (d) to protect visual quality. Each alternative describes the protective measures used in that alternative.

Protective requirements can be changed to address specific projects and plans after the RMP is approved. Requirements can be removed if the protected resource no longer exists (a raptor nest becomes inactive), or if the location of an activity is changed to avoid a protected resource. Protection not identified in the RMP could also be added as necessary, if these new requirements are consistent with the RMP and would not interfere with valid existing rights.

Criteria for Special Situations

Leasable Minerals Potential

The occurrence potential of leasable minerals (like oil, gas, tar sands, geothermal energy, coal, and coal bed methane) was estimated in the RMP EIS.

The Grass Creek planning area has a moderate to high potential for the occurrence of gas and oil; low to

moderate potential for coal, coal bed methane, and geothermal energy; and low potential for tar sands. This information and records of past minerals activities were used to estimate what types and amounts of future mineral development would take place in the planning area. These estimates of reasonably foreseeable development, were used to aid in the analysis of environmental consequences. Although exploration for leasable minerals could involve all of these resources, production during the next 15 years is anticipated primarily for gas and oil. About 40 acres of public land might be mined for coal.

Locatable Minerals Potential

The occurrence potential and reasonably foreseeable development scenarios of locatable minerals were estimated in the RMP EIS, just like they were for leasable minerals.

The locatable minerals bentonite, gypsum, sulfur, titanium, and uranium are known to occur in the planning area. Exploration and filing of mining claims for these, and platinum group minerals, would likely take place. However, actual mining during the next 15 years is anticipated only for bentonite.

Withdrawals and Classifications

Withdrawn or classified public lands sometimes cannot be sold or exchanged, and may be closed to land uses like the staking and development of mining claims. These restrictions on land uses are known as segregations, and remain in effect until the withdrawal or classification is terminated. If a withdrawal or classification is terminated, new land uses could take place. The RMP EIS describes the anticipated effects of these new uses and considers appropriate management, including the establishment of new protective withdrawals.

For providing a comparison of effects in this RMP EIS, all BLM-administered withdrawals and classifications, and their segregations, are assumed to continue under the alternative that describes BLM's current management (Alternative A). The other alternatives will address different types of management for these lands, based on the assumption that the withdrawals and classifications would be terminated.

If necessary, the Grass Creek RMP will include decisions to protect certain resources in the event that withdrawals or classifications on public lands are terminated. The Grass Creek RMP will not include decisions for withdrawn or classified lands administered by other agencies.

Wilderness

Wilderness management and recommendations on wilderness designation are not addressed in this RMP EIS. Wilderness management, related to four wilderness study areas in the Grass Creek Resource Area, is addressed in the Grass Creek/Cody Wilderness EIS published in August 1990. Pending a decision by Congress on designation of these areas, the Owl Creek, Bobcat Draw Badlands, Sheep Mountain, and Red Butte Wilderness Study Areas (Map 2) will be managed under the BLM's "Interim Management Policy and Guidelines for Lands Under Wilderness Review" (USDI, 1987). Before the BLM would authorize activities on public lands adjacent to these wilderness study areas, the potential impacts on wilderness qualities would be evaluated.

Should Congress designate part or all of any of the areas as wilderness, the management of the designated areas will be consistent with the designation alternative described in the Grass Creek/Cody Wilderness EIS, or as otherwise specified by Congress. Wilderness management site-specific activity plans will be developed for any designated wilderness areas. Management of any Wilderness Study Areas or parts of Wilderness Study Areas that are not designated as wilderness will be consistent with the nondesignation alternative described in the Grass Creek/Cody Wilderness EIS, or otherwise consistent with the approved Grass Creek RMP. The congressional decisions, for either designation, partial designation or nondesignation of the Wilderness Study Areas as wilderness, will be incorporated into the Grass Creek RMP and, if necessary, the RMP will be amended.

Wild and Scenic Rivers

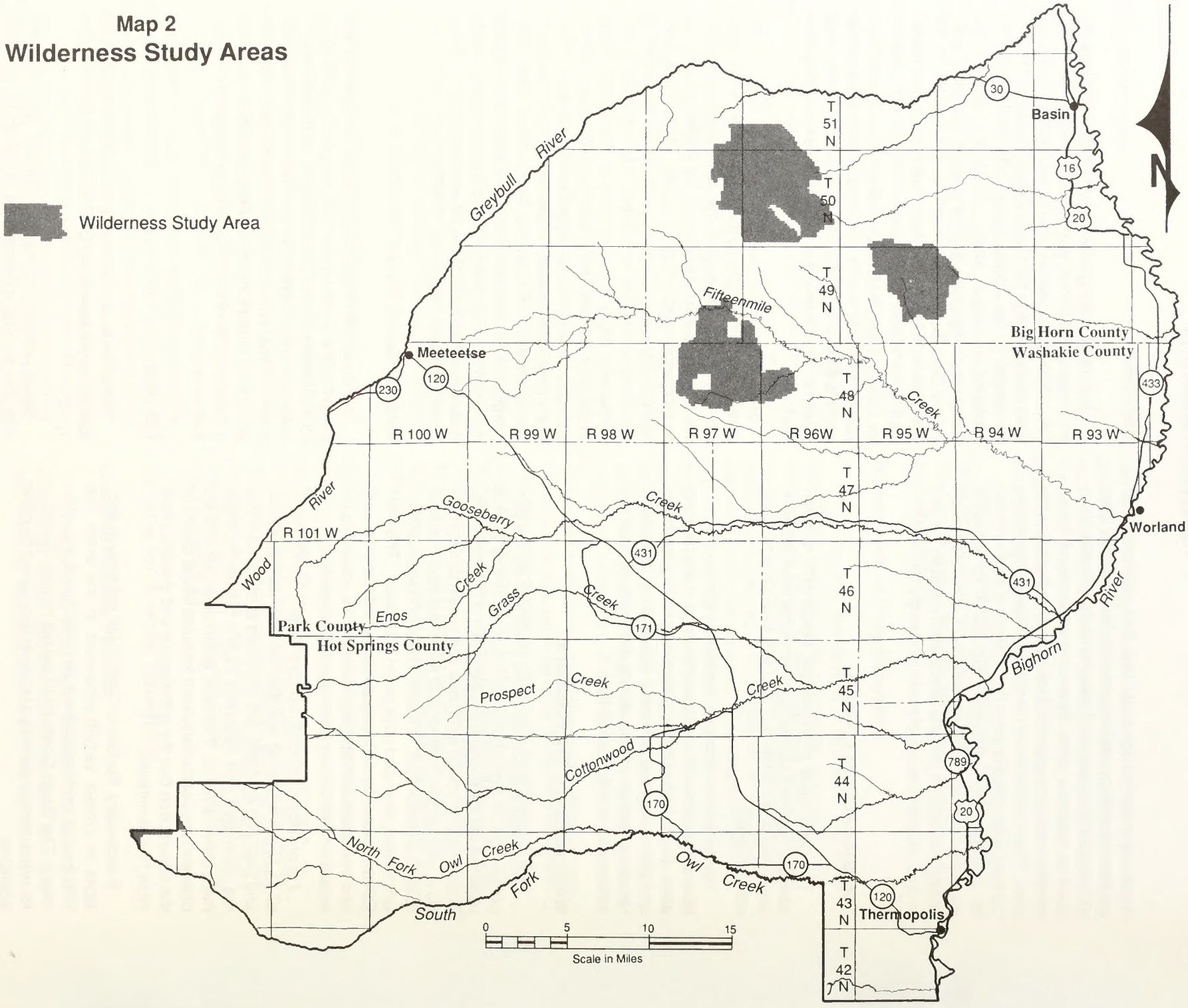
In the course of conducting the planning effort and preparing the Grass Creek RMP EIS, public lands along all waterways in the planning area were reviewed to determine their eligibility to be considered for inclusion in the National Wild and Scenic River System. No public lands were found to meet the eligibility criteria. Appendix 1 describes the review process and the specific criteria that were used.

Issues

The process for developing an RMP EIS begins with identifying the issues (40 CFR 1501.7; 43 CFR 1610.4-1).

Issues express concerns, conflicts, and problems with the existing management of public lands. Fre-

Map 2
Wilderness Study Areas



quently, issues are based on how land uses affect resources. Some issues are concerned with how land uses can affect other land uses, or how the protection of resources affect land uses.

The following planning issues were identified through public scoping and BLM's analysis of current management in the Grass Creek planning area:

Issue 1: Vegetation Management

Many land uses and resources depend on vegetation. There is a general concern for guarding against excessive removal of vegetative ground cover in the planning area. Reductions in vegetation and undesirable changes in plant composition can affect forage availability, wildlife habitat, and overall plant and animal diversity. Surface-disturbing activities associated with the physical movement of soil materials by equipment or vehicles for things such as construction of roads, rights-of-ways, structures and other facilities, remove vegetation and can accelerate soil erosion, affecting water quality and soil productivity. Heavy use of forage by livestock, wild horses, and wildlife could also reduce vegetative ground cover and cause harm to resources. The challenge is to protect resources but still allow uses or activities that support the local economy such as gas and oil development, mining, ORV travel, livestock grazing, and timber harvest.

Issue 2: Special Management Area Designations

There are concerns about too many restrictions on the uses of public lands because of special management area designations. There are also concerns about the need for special management emphasis or protection of unique or sensitive lands and resources. In some places, unique resources and biological diversity are in danger of being lost; in other places, special management may be required to protect a natural process or ecosystem, or protect the public from natural hazards. These areas may be suitable for management emphasis and for designation as areas of critical environmental concern, special recreation management areas (SRMAs), or wildlife habitat management areas.

Issue 3: Public Land and Resource Accessibility and Manageability

There are concerns that some public lands and resources are too accessible and susceptible to damage from overuse. There are also concerns that some public lands and resources are not accessible enough. The value of some lands and resources are enhanced by their accessibility and manageability. Most lands and resources need to be relatively accessible and manageable to be used and enjoyed; there must be public and administrative access so uses and management actions can occur. Some of these resources on the public lands are gas and oil, timber, wildlife, and recreational opportunities. There are also resources that could be damaged or destroyed by too much access or by access at an inappropriate time. Some of these are soils, vegetation, cultural resources, paleontological resources, visual resources, and wildlife. Management of the public lands should protect the quality of these resources, while maintaining resource accessibility.

CHAPTER 2

DESCRIPTIONS OF THE ALTERNATIVES INCLUDING THE PREFERRED RESOURCE MANAGEMENT PLAN

DEVELOPING ALTERNATIVES

This part of an RMP EIS describes the alternatives that have been developed and analyzed during the planning process. Each alternative represents a complete and reasonable land use plan (that is, alternative RMP) which could guide future management of public lands and resources in the planning area. Each alternative includes combinations of public land uses and resource management practices that respond to the planning issues. One alternative represents "no action," which is actually the continuation of current management. Other alternatives provide a range of choices or management options for solving problems associated with current management. Problems that exist under current management were identified by the interdisciplinary planning team and through public participation.

This chapter describes four resource management plan alternatives, including BLM's preferred alternative.

Documenting the comparisons of the differences among the alternatives is required by the BLM resource management planning regulations and the Council on Environmental Quality's regulations, all based on NEPA. Documenting the analysis of the effects associated with each alternative is also required. The analyses of alternatives A, B, and C, with help from the public, enabled BLM managers to develop the Preferred Alternative. Either Alternative A, B, or C could have been selected as the Preferred Alternative, or any of these alternatives could have been modified to make another alternative. In this case, the Preferred Alternative was developed by selecting logical and compatible management options from portions of alternatives A, B, and C.

Alternative A, the "no action" alternative, would continue current management practices on the basis of existing land use plans.

Compared to Alternatives A and C, Alternative B would reduce the level of land use restrictions, while emphasizing timber and livestock forage production, developed forms of recreation, and vehicle access.

Compared to Alternatives A and B, Alternative C would have higher levels of land use restrictions and would emphasize wild horse management, wildlife habitat enhancement, and the interpretation of historic and cultural resources.

The BLM's Preferred Alternative would generally place greater emphasis on protection of the natural environment compared to Alternatives A and B and would prescribe fewer restrictions on land use than Alternative C. The Preferred Alternative was developed to balance production of commodity uses with protection of the environment.

ALTERNATIVES AND MANAGEMENT OPTIONS CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

The following alternatives and management options were considered as possible ways to resolve the planning issues, but were eliminated from detailed study because they were unreasonable or not viable because of technical, legal, or other constraints.

Elimination of Livestock Grazing

The elimination of livestock grazing from all public lands in the planning area was considered as a possible method of resolving some of the planning issues related to vegetative resources. However, the interdisciplinary team and managers determined that the "no grazing" alternative should be eliminated from detailed study for the following reasons:

In general, resource conditions on public lands in the planning area, including range vegetation, watershed, and wildlife habitat are not the result of livestock grazing alone and are not in a state of such poor condition or downward trend that they cannot be maintained or enhanced or that would warrant elimination of livestock grazing on the public lands.

Public comments received during the scoping process and during preparation of the draft RMP EIS indicated a general acceptance of livestock grazing on the public lands, provided such grazing is properly managed.

Because of fragmented landownership in the planning area, it is highly unlikely that livestock grazing could

be eliminated. Either land exchanges to "block up" public lands, or extensive fencing would be needed to exclude livestock from public lands. It is doubtful that enough exchanges with private landowners could be accomplished to sufficiently "block up" public lands, and the amount of fencing needed to exclude livestock would disrupt wildlife movement and restrict public access. Also, elimination of livestock grazing would adversely affect social, economic, and cultural values in the planning area.

Therefore, it would be neither reasonable nor necessary to prohibit livestock grazing throughout the planning area. However, reduction or elimination of livestock grazing may be necessary in specific locations where livestock grazing excessively conflicts with other management objectives. Most of these reductions would be made during activity planning, and would be based on several factors including monitoring studies.

Elimination of Timber Harvesting

Possible elimination of all timber harvesting on public lands in the planning area was considered. However, the 14,000 acres of BLM-administered forestlands capable of sustaining forest production need to be harvested over time to maintain a healthy, vigorous forest. Because fire and, to an extent, disease have been eliminated by human influence, the harvesting of forest products helps sustain the ecological processes that maintain the healthy condition of the forest. Finally, harvesting forest products is consistent with BLM's multiple-use management policy and closure to these activities would be unreasonable and unnecessary.

Elimination of Gas and Oil Leasing

Closing the planning area to gas and oil leasing was considered to resolve conflicts with other resource uses. Public comments received during issue identification and development of planning criteria indicated general acceptance of gas and oil leasing and development, provided it is properly managed. It was further pointed out that, in most cases, gas and oil exploration and development could take place in a manner that would avoid unacceptable adverse impacts to the other resources in the planning area.

In addition, nearly the entire planning area is covered by federal gas and oil leases, and portions of the area are developed. This situation would continue for the entire time this plan is in effect. Eliminating federal gas and oil leasing in the entire planning area would be "over-kill" because resource conflicts tend to be located in specific areas, not areawide.

This option was eliminated from further analysis because it would be contrary to BLM policy that, with the exception of congressional withdrawals, public lands would remain open and available for mineral exploration and development, unless doing otherwise is clearly in the national interest. In addition, this would be directly contrary to the BLM's multiple-use management mandate in FLPMA and would also be unreasonable and unnecessary.

Maximum or Unconstrained Alternatives

Alternatives and general management options that proposed maximum development, production, or protection of one resource at the expense of other resources were not analyzed in detail. The purpose of the RMP is to provide multiple use management direction for the planning area. Generally, promoting a single land and resource use by eliminating all others does not meet the objectives of the BLM's multiple-use management mandate and responsibilities. However, the alternatives analyzed in detail do include various considerations for eliminating or maximizing individual resources or uses in specific areas where conflicts would otherwise exist.

ALTERNATIVES ANALYZED IN DETAIL

The four alternatives considered in the Grass Creek RMP EIS are described and compared in Table 2. Table 3 details information referenced in Table 2, about the use of constraints on surface-disturbing activities to protect important lands and resources.

Assumptions for analyzing the environmental consequences of the alternatives are described in Table 15. Table 16 is a comparative summary of the consequences of the alternatives. (Tables 15 and 16 are in Chapter 4.)

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
AIR QUALITY MANAGEMENT	MANAGEMENT OBJECTIVE: Maintain or enhance air quality, protect public health and safety, and minimize emissions resulting in acid rain or degraded visibility.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	MANAGEMENT ACTIONS: BLM-initiated or authorized actions, such as the use of prescribed fire, would avoid violation of Wyoming and national air quality standards. This would be accomplished through the coordination of BLM-managed activities with the Wyoming Department of Environmental Quality (DEQ) and the U.S. Environmental Protection Agency (EPA).	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Special requirements would be applied on a case-by-case basis to alleviate air quality problems. Special requirements could include such things as limiting emissions and covering conveyors.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Air quality standards are monitored by the Wyoming DEQ. (See the Affected Environment chapter for these standards.) Air quality permits would be obtained from DEQ before prescribed fires are set on public land. Smoke and pollution would be minimized as described in the Smoke Management Guidebook (BLM 1985).	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
AIR QUALITY MANAGEMENT (Continued)	BLM would coordinate with the Wyoming Department of Environmental Quality (DEQ) and the Environmental Protection Agency (EPA) on developing air quality standards and guidelines as needed.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Dust control measures to reduce visibility impacts would be required for all construction and other surface-disturbing activities.	Minimal dust control measures and restrictions would be applied.	Same as Alternative A.	Same as Preferred.
CULTURAL, PALEONTOLOGICAL, AND NATURAL HISTORY RESOURCES MANAGEMENT	MANAGEMENT OBJECTIVES: Protect and preserve important cultural, paleontological, and natural history resources. Expand opportunities for scientific and educational uses of these resources.	Same as Preferred.	Protect and conserve significant cultural, paleontological, and natural history resources in response to proposed surface-disturbing activities. Showcase the history of traditional prehistoric and historic land uses.	Same as Preferred.
	Protect, study, and expand the interpretation of rock art in the Meeteetse Draw area. (See Map 3.)	Same as Preferred.	Protect rock art when necessary in response to proposed surface-disturbing activities.	Same as Preferred.
	MANAGEMENT ACTIONS: Site-specific inventories for cultural resources would be required before the start of surface-disturbing activities. Adverse effects on significant resources would be mitigated, or the resources themselves would be avoided by surface-disturbing activities.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
CULTURAL, PALEONTOLOGICAL, AND NATURAL HISTORY RESOURCES MANAGEMENT (Continued)	Sites listed on the National Register of Historic Places would be appropriately protected. Investigations of violations of the Archaeological Resources Protection Act would be conducted.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Rock art, as well as prehistoric and historic archaeological sites and districts associated with specific time periods or cultures, would be managed for scientific, public, and sociocultural use. General areas would be managed for research, with emphasis on interpreting former ecosystems. Specific sites or areas would be preserved for future study and use.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	The Legend Rock Petroglyph Site would be managed for public education in cooperation with the state of Wyoming.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	The development of a cooperative management agreement with private landowners would be pursued to emphasize enhancement and conservation of the Legend Rock Petroglyph Site.	An exchange would be pursued to acquire privately-owned land at the Legend Rock Petroglyph Site.	No similar action.	Same as Preferred.
	In the Meeteetse Draw area, interpretive sites would be developed to highlight rock art, making use of such things as scenic overlooks and interpretive signs and trails.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
CULTURAL, PALEONTOLOGICAL, AND NATURAL HISTORY RESOURCES MANAGEMENT (Continued)	Legal public access would be pursued in the Meeteetse Draw area to enhance management of the area.	Same as Preferred.	No similar action.	Same as Preferred.
	To protect Native American cultural values, the Meeteetse Draw area would be avoided for the placement of future rights-of-way.	Same as Preferred.	No similar action.	Same as Preferred.
	Portions of the town of Gebo and adjacent coal mining areas on public land would be managed for preservation and interpretation of cultural and historic values. Management could include actions like development of an interpretive road loop.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Other cultural resource interpretive sites would be developed, making use of such things as scenic overlooks, signs, and walking trails. Sites could include rock art and historic trails such as the Thermopolis to Meeteetse Trail, the Fort Washakie to Red Lodge Trail, the Mexican Pass Trail, and the Jim Bridger Trail.	No similar action.	No similar action.	Same as Preferred.
	As appropriate, specific sites would be managed for their traditional Native American cultural values.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
CULTURAL, PALEONTOLOGICAL, AND NATURAL HISTORY RESOURCES MANAGEMENT (Continued)	Historic resources in ten gas and oil fields would be managed for scientific and public use. The purpose would be to improve knowledge of the historic significance of the fields and facilitate the approval of future development and reclamation activities. The following fields would be included: Hamilton Dome, Grass Creek, Little Buffalo Basin, Walker Dome, Enos Creek, Golden Eagle, Gooseberry, Hidden Dome, Little Grass Creek, and Gebo.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Adverse effects would be avoided on land and resource values listed in National Park Service (NPS) inventories of possible National Natural Landmarks (NNLs). These lands and resources include paleontological and scenic values at Tatman Mountain and in the badlands north of Wyoming Highway 431.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	A paleontological collecting permit would be required for the collection of any fossil vertebrates and for the collection of significant fossil invertebrates and plants.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Important paleontological resources would be managed for scientific and public use.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
CULTURAL, PALEONTOLOGICAL, AND NATURAL HISTORY RESOURCES MANAGEMENT (Continued)	Potential effects on paleontological resources would be considered in site-specific environmental analyses, prior to the authorization of surface-disturbing activities. As appropriate, site-specific inventories would be required where significant fossil resources are known or anticipated to occur.	No similar action.	No similar action.	Same as Preferred.
	Hobby collection of invertebrate fossils would be allowed only in specified areas.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Closing lands or restricting uses to protect paleontological resources would be evaluated case-by-case.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Surface-disturbing and disruptive activities associated with the construction and use of interpretive sites and facilities would be subject to appropriate mitigation measures and constraints (Table 3).	Same as Preferred.	Same as Preferred.	Same as Preferred.
FIRE MANAGEMENT	MANAGEMENT OBJECTIVE: The objectives of the fire program are to: (1) cost-effectively protect life, property, and resource values from wildfire; and (2) use prescribed fire to achieve multiple use management goals.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
FIRE MANAGEMENT (Continued)	MANAGEMENT ACTIONS: Limited suppression (see Glossary) of wildfire would take place on lands north and east of Wyoming Highway 120 and lands east of Hamilton Dome, encompassed by Wyoming Highways 120 and 170. These limited suppression areas total about 744,400 acres of public land. (See Map 4.)	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Fires in limited suppression areas would be monitored to insure they do not threaten state or private lands, property, gas and oil fields, important riparian habitat, or human life.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Full suppression (see Glossary) would be used on fires spreading to within 0.25 mile of state or private lands, property, gas and oil fields, important riparian habitat, or human life.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Full suppression of wild fire would take place on the remaining public lands, comprising about 219,800 acres.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	The locations and applications of these fire suppression categories may periodically vary as adjustments and revisions are made to the Worland District and Grass Creek Resource Area fire management plans.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
FIRE MANAGEMENT (Continued)	The Grass Creek Resource Area Fire Management Plan would be maintained and revised, as necessary, and implemented. The plan would address ecological areas for fire management based on fire ecology studies and would establish desired plant community and landscape goals that promote biological diversity. The plan would also address specific applications of prescribed fire to meet resource objectives.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Travel restrictions would limit the use of fire vehicles to existing roads and trails in the badlands north of Wyoming Highway 431, in the upper portions of Owl Creek, the Red Canyon Creek area, on lands near the Legend Rock Petroglyph Site, and on lands surrounding Wardel Reservoir.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	The use of bulldozers would generally be prohibited in wetland/riparian areas, in areas of significant cultural resources or historic trails, and in important wildlife birthing areas.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Fire retardant drops by air tankers would be prohibited within 200 feet of water.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
FIRE MANAGEMENT (Continued)	Prescribed fire would be used to accomplish resource management objectives. These objectives include use of fire to rehabilitate old timber sale areas and recycle nutrients to the soil, reduce hazardous fuels, remove trees infested by the mountain pine beetle, rid timber sale areas of slash, maintain certain age classes of trees, improve timber stand diversity and productivity, improve wetland/riparian areas, modify or remove sagebrush stands to benefit wildlife habitat, reestablish aspen stands, improve watershed values, and remove sagebrush, juniper, and limber pine to increase livestock forage production.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	When prescribed fire or mechanical treatments can be used effectively as techniques for managing vegetation, they would be preferred over chemical spraying.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Surface-disturbing and disruptive activities associated with all types of fire management would be subject to appropriate mitigation measures and constraints (Table 3).	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
FORESTLAND MANAGEMENT	MANAGEMENT OBJECTIVE: Maintain and enhance the health, productivity, and biological diversity of forest and woodland ecosystems. A balance of natural resource benefits and uses would be provided to present and future generations. The management of forest and woodland resources would be consistent with ecosystem management principles.	Manage forestlands for wildlife habitat, livestock forage, watershed protection, recreation, scenic quality, and commercial forest products.	Manage forestlands for commercial forest products.	Manage forestlands for noncommodity resources.
	MANAGEMENT ACTIONS: Road construction for harvesting timber or for conducting forest management practices would be prohibited on slopes greater than 25 percent, unless site-specific environmental analyses demonstrate that effects can be mitigated or avoided.	Same as Preferred.	Same as Preferred.	Road construction for harvesting timber or for conducting forest management practices would be prohibited on slopes greater than 25 percent.
	Skidder-type yarding would be prohibited on slopes greater than 45 percent. Other logging operations on slopes steeper than 45 percent would be limited to technically, environmentally, and economically acceptable methods such as cable yarding.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
FORESTLAND MANAGEMENT (Continued)	Emphasis for silvicultural practices and timber harvesting would be placed on areas where forest health is the primary concern (including forests that are infested by mistletoe or mountain pine beetles). Forest management areas are shown on Map 5.	Same as Preferred.	Emphasis for silvicultural practices and timber harvesting would be placed on areas where timber stands have reached their rotation age (of 120 to 160 years).	Emphasis for silvicultural practices and timber harvesting would be placed on producing forest stands for wildlife thermal cover.
	A variety of forest silvicultural and cutting methods would be used such as clearcutting, shelterwood, individual tree selection, and various regeneration treatments.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Severely mistletoe-infested stands would be clearcut while stagnated, and overstocked pole timber stands would be thinned, if there is a chance that they would respond with further growth and produce wildlife thermal cover.	All mistletoe-infested, stagnated, and overstocked pole timber stands would be clearcut.	Same as Alternative A.	Same as Preferred.
	Overstocked seedling, sapling, and pole stands would be precommercially thinned on up to 800 acres to increase timber production and improve long-term wildlife thermal cover.	Overstocked seedling, sapling, and pole stands would be precommercially thinned on about 200 acres to increase timber production.	These stands would be precommercially thinned on about 800 acres to increase timber production.	These stands would be precommercially thinned on about 800 acres to improve long-term wildlife thermal cover.
	All harvest areas would be regenerated by natural or artificial means. If at the end of fifteen years any clearcut area fails to regenerate naturally, planting and other methods would be used to assure regeneration unless converting vegetation to another type is the objective.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
FORESTLAND MANAGEMENT (Continued)	Emphasis for silvicultural practices and timber harvesting would be placed on conifer stands to increase the viable component of aspen, when possible. Other methods to improve aspen would include use of prescribed fire, noncommercial thinning of conifers, and fencing of aspen stands to protect from wildlife and livestock use.	Same as Preferred.	Emphasis on silvicultural practices and timber harvesting would be placed on conifer stands to enhance sawtimber production. Aspen improvement would not be emphasized.	Same as Preferred.
	In seasonal wildlife habitat areas, clearcuts generally would not exceed 300 yards (approximately 15 acres) in any direction. Wildlife escape cover would be maintained by keeping a corridor of timber around, or on one or more side of, roads, clearcuts, parks, wetlands, and wallows. Trees and snags would not be cut if they provide important habitat for cavity or snag-nesting wildlife.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Slash disposal would be tailored to promote reforestation, minimize erosion, and allow ease of movement for wildlife.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Forest products would be sold from limber pine and juniper woodland areas to meet public demand for posts, poles, firewood, and specialty wood consistent with wildlife habitat requirements.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
FORESTLAND MANAGEMENT (Continued)	Harvesting firewood along desert waterways and the Bighorn and Greybull rivers would be prohibited.	Same as Preferred.	Harvesting dead and down wood would be allowed.	Same as Preferred.
	Prescribed fire would be used to improve aspen stands, regenerate old age forest stands, manage for desired successional stages and forest species composition, and rehabilitate harvest areas.	Same as Preferred.	Prescribed fire would be used primarily to rehabilitate harvest areas.	Prescribed fire would be used primarily to improve aspen stands.
	Surface-disturbing and disruptive activities associated with all types of forest management would be subject to appropriate mitigation measures and constraints (Table 3).	Same as Preferred.	Same as Preferred.	Same as Preferred.
HAZARDOUS MATERIALS AND WASTES	MANAGEMENT OBJECTIVE: Protect public and environmental health and safety on public lands, emphasize waste reduction and minimization for BLM-authorized and initiated actions, comply with applicable federal and state laws, prevent waste contamination from any BLM-authorized actions, minimize federal exposure to the liabilities associated with waste management on public lands, and integrate hazardous materials and waste management policies and controls into all BLM programs.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
HAZARDOUS MATERIALS AND WASTES (Continued) ***General***	Surface-disturbing and disruptive activities associated with all types of hazardous materials and waste management would be subject to appropriate mitigation measures and constraints (Table 3).	Same as Preferred.	Same as Preferred.	Same as Preferred.
Hazardous Materials	MANAGEMENT ACTIONS: For BLM-authorized activities that involve hazardous materials or their use, precautions would be taken to guard against releases into the environment. In the event of a release of hazardous materials on the public land, appropriate warnings would be provided to potentially affected communities and individuals, and precautions would be taken against public exposure to contaminated areas.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Sale, exchange, or other transfer of public lands on which storage or disposal of hazardous substances has been known to occur would require public notification of the type and quantity of the substances.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
Hazardous Wastes	Public lands contaminated with hazardous wastes would be reported, secured, and cleaned up according to federal and state laws, regulations, and contingency plans, including the federal Comprehensive Environmental Response, Compensation, and Liability Act. Parties responsible for contamination would be liable for cleanup and resource damage costs, as prescribed by law.	Same as Preferred.	Same as Preferred.	Same as Preferred.
LANDS AND REALTY MANAGEMENT	MANAGEMENT OBJECTIVE: Support the multiple-use management goals of the various BLM resource programs; respond to public requests for land use authorizations, sales, and exchanges; and acquire access to serve administrative and public needs.	Same as Preferred.	Same as Preferred.	Same as Preferred.
Access	MANAGEMENT ACTIONS: The BLM would pursue public access on important roads and trails listed in the BLM transportation plan. The transportation plan would be updated as necessary and implemented to provide access to large blocks of public land or to smaller parcels of land having high public values.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	BLM would maintain or improve existing opportunities for public access in the upper Grass Creek area.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
Access (Continued)	Emphasis would be placed on acquisition of access to public lands on the Bighorn and Greybull rivers to enhance recreational opportunities and wildlife management.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	BLM would pursue a combination of motorized and nonmotorized vehicle access in the Enos Creek, upper Cottonwood Creek, and upper South Fork of Owl Creek areas of the Absaroka Mountain foothills. Goals would be to provide vehicle access to the South Fork of Owl Creek to improve fishing and other recreational opportunities and to acquire foot and horseback access to the Shoshone National Forest. All access would be limited seasonally and to specific routes as appropriate.	Same as Preferred.	BLM would pursue additional motorized vehicle access in the Enos Creek, upper Cottonwood Creek, and upper South Fork of Owl Creek areas of the Absaroka Mountain foothills. Goals would be to provide vehicle access to the South Fork of Owl Creek to improve fishing and other recreational opportunities and to acquire vehicle access to the Shoshone National Forest.	Same as Preferred.
	The BLM would pursue limited motorized vehicle access on roads in the Red Canyon Creek area consistent with an overall objective to emphasize primitive recreation.	Same as Preferred.	The BLM would pursue motorized vehicle access on main roads in the Red Canyon Creek area.	Easements for motorized vehicle access would not be pursued in the Red Canyon Creek area, although access for nonmotorized travel would be pursued.
	The BLM would pursue legal motorized vehicle access in the Meeteetse Draw area to enhance management of the area for interpretive value.	Same as Preferred.	No similar action.	Same as Preferred.
	Access to specific areas may be closed or restricted to protect public health and safety, and significant or fragile resources.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
Landownership Adjustments	Before any public lands are exchanged or sold, or before the BLM would attempt to acquire any other lands in the planning area, the BLM would consult with county commissioners and other representatives of local government in the affected areas.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	About 1,220 acres would be considered for suburban expansion, community landfills, industrial and commercial development, and other public needs near the communities of Worland, Thermopolis, Meeteetse, and Basin.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Agricultural trespass on public land would generally be resolved by prohibiting the unauthorized use; however, land sales or leases could resolve agricultural trespass in some cases. Leases might be used to develop the lands as wildlife food and cover areas. Agricultural trespass is estimated to occur on about 400 acres.	Same as Preferred.	Same as Preferred.	These lands would not be sold, although lease agreements would be considered.
	Applications for desert land entry on public lands would not be considered. Public lands having agricultural potential and water would be considered for disposal only by sale or exchange.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
Landownership Adjustments **(Continued)**	Proposals for sale, exchange, or transfer of public land would be subject to criteria described in Appendix 2. Priority would be given to landownership adjustments that meet community needs. The preferred method of adjusting landownership would be exchange.	Same as Preferred.	Same as Preferred.	Proposals for landownership adjustments, other than those for community expansion, would not be considered unless a land exchange were involved.
	Approximately 33,700 acres of public lands that are difficult or uneconomic to manage (Map 6) would have priority consideration for public sale, Recreation and Public Purposes Act lease or patent, exchange, or transfer of jurisdiction to another agency. Other proposals for these types of actions on any other public lands in the planning area would also be considered on a case-by-case basis.	Same as Preferred.	Same as Preferred.	Approximately 33,700 acres of public lands would not be given consideration for sale. However, all lands in the planning area would be given consideration for exchange with the condition that there would be no net loss of crucial wildlife habitat.
	Exchanges would be pursued to improve management of important seasonal wildlife habitat areas in the upper portions of Owl, Cottonwood, Gooseberry, and Grass creeks.	Same as Preferred.	No similar action.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
Landownership Adjustments **(Continued)**	Exchanges would be pursued along Gooseberry Creek, the upper portions of Cottonwood and Grass creeks, the Bighorn and Greybull rivers, and on lands where other wetland/riparian areas occur. The purposes of these exchanges would be to block up public land, enhance public access, and improve public land manageability.	Same as Preferred.	No similar action.	Same as Preferred.
	Cooperative agreements or land exchanges with private landowners would be pursued to emphasize enhancement and conservation of the Legend Rock Petroglyph Site.	An exchange would be pursued to acquire privately-owned land at the Legend Rock Petroglyph Site.	No similar action.	Same as Preferred.
	Cooperative agreements or land exchanges to improve wild horse management would be pursued on about 16,000 acres of privately-owned land.	Land exchanges to improve wild horse management would be pursued on about 12,000 acres of privately-owned land.	No similar action.	Same as Preferred.
Rights-of-Way	Most of the planning area would be open for rights-of-way development. Proposals would be addressed on an individual basis with emphasis on avoiding certain conflict or sensitive areas.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Two right-of-way corridors would be designated. (See Map 7.) These would be the preferred locations for placement of future rights-of-way.	Right-of-way corridors would not be designated. However, right-of-way concentration areas, including transmission lines and communication sites, would be the preferred locations for placement of future rights-of-way.	Same as Preferred.	Same as Alternative A.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
Rights-of-Way **(Continued)**	The construction or modification of rights-of-way along Wyoming highways 120 and 431 would be evaluated individually to assure that adverse effects on scenic values are not increased. Public lands along these routes to Yellowstone National Park would not be designated avoidance areas for rights-of-way.	To protect scenic values along major travel routes to Yellowstone National Park, the placement of utility rights-of-way would be avoided along Wyoming highways 120 and 431. When rights-of-way could not be avoided in these areas, they would be built to intensively mitigate adverse effects to scenic values.	Same as Preferred.	Same as Alternative A.
	To protect Native American cultural values, the Meeteetse Draw area would be avoided for the placement of future rights-of-way.	Same as Preferred.	No similar action.	Same as Preferred.
	No similar action.	No similar action.	No similar action.	The following areas would be right-of-way avoidance areas: elk, moose, and bighorn sheep winter and birthing areas; scenic areas identified as visual resource management (VRM) class I or II areas (see Glossary); the Absaroka Mountain Foothills, and the badlands north of Wyoming 431. (See Map 8.)
	Surface-disturbing and disruptive activities associated with all types of rights-of-way construction and maintenance would be subject to appropriate mitigation measures and constraints (Table 3).	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
Withdrawals	All coal and phosphate classifications (Map 9) would be terminated and the lands would be returned to operation of the General Mining Laws.	All coal and phosphate classifications would be retained and those lands would remain closed to the staking of mining claims for gypsum, bentonite, and other nonmetalliferous minerals. Appendix 2 describes the withdrawals and classifications, the acres affected, and the segregative effects.	Same as Preferred.	Same as Preferred.
	A locatable mineral withdrawal would be pursued on about 1,200 acres of public land to protect recreation and wildlife values on public river tracts along the Bighorn River. (See Map 10.)	Same as Preferred.	No similar action.	Same as Preferred.
	Locatable mineral withdrawals would be pursued within 0.25 mile of the Legend Rock Petroglyph Site on about 630 acres of BLM-administered minerals, and in the immediate vicinity of rock art in the Meeteetse Draw area near Thermopolis.	No similar action.	No similar action.	Same as Preferred.
	A locatable mineral withdrawal would be pursued in the Absaroka Foothills on about 17,100 acres of public land to protect scenic values, wildlife habitat, soil, and water.	No similar action.	No similar action.	Same as Preferred.
LIVESTOCK GRAZING MANAGEMENT	MANAGEMENT OBJECTIVE: Improve forage production and range condition to benefit livestock, wildlife, wild horses and watersheds.	Same as Preferred.	Improve forage production and range condition primarily to benefit watershed resources and livestock.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
LIVESTOCK GRAZING MANAGEMENT (Continued)	MANAGEMENT ACTIONS: The level of actual livestock grazing would not exceed active preference (see Glossary). Currently, active preference is 101,451 animal unit months (AUMs) per year. Each allotment has been placed in one of three selective management categories, identified as maintain (M), improve (I), or custodial (C), based on criteria shown in Appendix 3.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	The current amounts, kinds, and seasons of livestock grazing use would continue to be authorized until monitoring indicates a grazing use adjustment is necessary, or an environmental assessment indicates that a permittee's application to change grazing use is appropriate.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Adjustments in livestock grazing preference would be made as a result of monitoring and consultation or negotiation with grazing permittees and other affected interests. Adjustments may also result from land use planning decisions to change the allocation of land uses or from transfers of public land to other agencies or into nonfederal ownership.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
LIVESTOCK GRAZING MANAGEMENT (Continued)	Authorized livestock grazing preference may be reduced in areas with excessive soil erosion, poor vegetative condition, or as necessary to provide forage for wildlife and wild horses, or to improve the visual quality of lands with high recreational value.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Livestock grazing monitoring intensity would vary, with higher levels occurring in "I" category allotments than in "M" and "C" category allotments. Livestock operators and other affected interests would be asked to assist BLM in developing objectives, in selecting key areas to monitor, and in gathering data.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Where practical, the public land tracts along the Bighorn River would be closed to livestock grazing unless grazing is used as a method of vegetative treatment.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
LIVESTOCK GRAZING MANAGEMENT (Continued)	BLM livestock grazing permittees and other interested parties would implement management actions including the use of grazing systems, land treatments, and range improvements. Proposal and design of these actions would normally be developed through activity and management implementation plans such as allotment management plans (AMPs) or coordinated resource management plans. Activity planning would be conducted or updated for "I" category allotments.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	The placement of salt and mineral supplements on public lands would be allowed outside wetland/riparian areas, and reclaimed or reforested areas, in locations designed to improve livestock distribution.	The placement of salt and mineral supplements on public lands would be prohibited in wetland/riparian areas and within 400 yards of water.	Same as Preferred.	Same as Preferred.
	Important wetland/riparian habitat areas would be fenced to control the duration and timing of livestock use, if the condition of these areas is declining and other types of grazing management do not produce a favorable response.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	When prescribed fire or mechanical treatments can be used effectively as techniques for managing vegetation, they would be preferred over chemical spraying.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
LIVESTOCK GRAZING MANAGEMENT (Continued)	Grazing strategies would be designed to accommodate plant growth requirements of key vegetation species and their management objectives.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	In Salt Desert Shrub and Salt Bottom plant communities that are grazed during the growing season, grazing strategies would be designed to allow a combined forage utilization of 25 to 35 percent of the current year's growth. (Combined forage utilization includes all types of consumption or destruction of vegetation by livestock, wildlife, wild horses, insects, hail, etc.) *Information applicable to all alternatives on how utilization data would be collected and interpreted is in Appendix 3*.	In Salt Desert Shrub and Salt Bottom plant communities that are grazed during the growing season, grazing strategies would be designed to allow a combined forage utilization of 30 to 50 percent of the current year's growth.	Same as Preferred.	In Salt Desert Shrub and Salt Bottom plant communities that are grazed during the growing season, grazing strategies would be designed to allow a combined forage utilization of 25 to 30 percent of the current year's growth.
	In other plant communities that are grazed during the growing season, grazing strategies would be designed to allow a combined forage utilization of 30 to 50 percent of the current year's growth.	Same as Preferred.	Same as Preferred.	In other plant communities that are grazed during the growing season, grazing strategies would be designed to allow a combined forage utilization of 30 to 40 percent of the current year's growth.
	In all plant communities that are grazed when plants are dormant, a combined forage utilization of up to 60 percent of the current year's growth would be allowed.	Same as Preferred.	Same as Preferred.	In all plant communities that are grazed when plants are dormant, a combined forage utilization of up to 40 percent of the current year's growth would be allowed.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
LIVESTOCK GRAZING MANAGEMENT (Continued)	Combined utilization of key grasses would be limited on up to 13,000 acres in portions of seven allotments within bighorn sheep habitat. ***Use of the term "limited" means that utilization objectives would be lower than the maximum levels shown above***.	Same as Preferred.	No similar action.	Same as Preferred.
	Domestic sheep grazing would be restricted within 2 miles of bighorn sheep habitat, affecting up to 34,000 acres in portions of nine grazing allotments. ***Use of the term "restricted" means that activities would be prohibited unless adverse effects can be avoided or mitigated based on site-specific analysis. Existing uses would be allowed pending site-specific analysis***.	Same as Preferred.	No similar action.	Domestic sheep grazing would be restricted within 20 miles of bighorn sheep habitat, affecting up to 288,000 acres in portions of 56 grazing allotments.
	Combined utilization of key grasses would be limited on up to 76,000 acres in portions of 37 allotments in elk crucial winter ranges.	Same as Preferred.	No similar action.	Combined utilization of key grasses would be limited on up to 195,000 acres in portions of 42 allotments in elk winter and crucial winter ranges.
	Water developments for livestock would be restricted on up to 76,000 acres in portions of 37 grazing allotments in elk crucial winter ranges.	No similar action.	No similar action.	Water developments for livestock would be restricted on up to 195,000 acres in portions of 42 grazing allotments in elk winter and crucial winter ranges.
	Livestock grazing strategies would include a variety of methods in elk crucial winter ranges.	Livestock grazing strategies would periodically rest some pastures in elk crucial winter ranges.	No similar action.	Livestock grazing strategies would include resting pastures in both elk winter and crucial winter ranges.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
LIVESTOCK GRAZING MANAGEMENT (Continued)	Livestock grazing from May 1 through June 30 would be restricted on up to 44,000 acres of elk calving habitat in portions of 23 grazing allotments.	Same as Preferred.	No similar action.	Same as Preferred.
	Combined utilization of woody riparian vegetation would be limited on up to 269 acres of riparian habitat in moose winter and crucial winter range in 13 grazing allotments.	Combined utilization of woody riparian vegetation would be limited on up to 261 acres of riparian habitat in moose crucial winter range in ten grazing allotments.	No similar action.	Same as Preferred.
	Livestock grazing would be managed to enhance riparian stream habitat on approximately 1,484 acres of public land. Portions of 66 grazing allotments within deer winter and crucial winter ranges would be affected.	Livestock grazing would be managed to enhance riparian stream habitat on approximately 1,421 acres of public land. Portions of 52 grazing allotments within deer crucial winter ranges would be affected.	No similar action.	Same as Preferred.
	Domestic sheep grazing would be restricted on up to 121,000 acres of pronghorn antelope crucial winter ranges in portions of 64 allotments.	Same as Preferred.	No similar action.	Domestic sheep grazing would be restricted on up to 490,000 acres of pronghorn antelope winter and crucial winter ranges in portions of 82 allotments.
	Domestic horse grazing would be restricted in portions of 14 grazing allotments that are adjacent to the Fifteenmile wild horse herd area.	Domestic horse grazing would be restricted in portions of 13 grazing allotments that are adjacent to the Fifteenmile wild horse herd area.	Domestic horse grazing would be considered on an individual basis in these allotments and in the Fifteenmile wild horse herd area.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
LIVESTOCK GRAZING MANAGEMENT (Continued)	Livestock grazing strategies on vegetative treatment areas would generally include: deferment of livestock use during two growing seasons following treatment with moderate use of dormant vegetation being allowed. (Also see the section on Vegetation Management -- Desired Plant Communities. Vegetation treatments would be used to meet the plant objectives described in that section for each alternative.)	Livestock grazing strategies on vegetative treatment areas would generally include: rest the first year following treatments and deferment of livestock grazing through seed ripe on key species the second year.	Same as Preferred.	Same as Preferred.
	Surface-disturbing and disruptive activities associated with all types of range project construction and maintenance would be subject to appropriate mitigation measures and constraints (Table 3).	Same as Preferred.	Same as Preferred.	Same as Preferred.
MINERALS MANAGEMENT	MANAGEMENT OBJECTIVE: Maintain or enhance opportunities for mineral exploration and development, while maintaining other resource values.	Same as Preferred.	Same as Preferred.	Same as Preferred.
General	MANAGEMENT ACTIONS: Surface-disturbing and disruptive activities associated with all types of minerals exploration and development and with geophysical exploration would be subject to appropriate mitigation measures and constraints (Table 3).	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
Leasable Minerals				
Coal	The coal screening process (as identified in 43 CFR 3420.1-4) has not been conducted in the planning area. Interest in the exploration for, or the leasing of, federal coal would be handled on an individual basis. If an application for a coal exploration license or federal coal lease is received, an appropriate land use and environmental analysis, including the coal screening process, would be conducted to determine whether the coal areas are acceptable for development and for leasing (43 CFR 3425). Existing land use plans would be amended as necessary.	Same as Preferred.	Same as Preferred.	Same as Preferred.
Geothermal	Geothermal resources would be available for leasing in areas that are open to gas and oil leasing. Areas closed to gas and oil leasing would also be closed to geothermal leasing.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Surface-disturbing and disruptive activities associated with all types of geothermal exploration and development would be subject to appropriate mitigation measures and constraints (Table 3).	Same as Preferred.	Same as Preferred.	Same as Preferred.
Gas and Oil	The entire planning area (about 1,171,000 acres of BLM-administered mineral estate) would be open to gas and oil leasing under the following conditions:	The entire planning area (about 1,171,000 acres of BLM-administered mineral estate) would be open to gas and oil leasing under the following conditions:	The entire planning area (about 1,171,000 acres of BLM-administered mineral estate) would be open to gas and oil leasing under the following conditions:	The entire planning area (about 1,171,000 acres of BLM-administered mineral estate) would be open to gas and oil leasing under the following conditions:

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
Gas and Oil (Continued)	About 20,200 acres of BLM-administered mineral estate would be open to leasing with a "no surface occupancy" stipulation. (See Glossary.) Map 11 shows examples of how stipulations would be applied to gas and oil leasing.	About 10,800 acres of BLM-administered mineral estate would be open to leasing with a "no surface occupancy" stipulation. (See Map 12.)	About 360 acres of BLM-administered mineral estate would be open to leasing with a "no surface occupancy" stipulation. (See Map 13.)	About 144,400 acres of BLM-administered mineral estate would be open to leasing with a "no surface occupancy" stipulation. (See Map 14.)
	About 138,800 acres would be open to leasing with controlled-surface use stipulations.	About 75,000 acres would be open to leasing with controlled-surface use stipulations.	About 480 acres would be open to leasing with controlled-surface use stipulations.	About 74,300 acres would be open to leasing with controlled-surface use stipulations.
	About 399,200 acres would be open to leasing with timing stipulations to protect wildlife.	About 400,600 acres would be open to leasing with timing stipulations to protect wildlife.	About 69,100 acres would be open to leasing with timing stipulations to protect wildlife.	About 340,600 acres would be open to leasing with timing stipulations to protect wildlife.
	About 612,800 acres would be open to leasing with standard lease terms and conditions.	About 684,600 acres would be open to leasing with standard lease terms and conditions.	About 1,101,060 acres would be open to leasing with standard lease terms and conditions.	About 611,700 acres would be open to leasing with standard lease terms and conditions.
Other Leasable Minerals	Leasing of other minerals such as phosphates or sodium would be considered on a case-by-case basis.	Same as Preferred.	Same as Preferred.	Same as Preferred.
Locatable Minerals	All coal and phosphate classifications (Map 9) would be terminated and the lands would be returned to operation of the General Mining Laws.	All coal and phosphate classifications would be retained and those lands would remain closed to the staking of mining claims for gypsum, bentonite, and other nonmetalliferous minerals.	Same as Preferred.	Same as Preferred.
	Except for specific areas identified as closed, the planning area would be open to the staking of mining claims and operation of the mining laws for locatable minerals.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
Locatable Minerals **(Continued)**	Plans of operations or notices of intent would be required for locatable minerals exploration and development consistent with the regulations (43 CFR 3809).	Same as Preferred.	Same as Preferred.	Same as Preferred.
	All locatable minerals actions would be reviewed to assure compliance with the BLM bonding policy for surface-disturbing activities.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	A locatable mineral withdrawal would be pursued on about 1,200 acres of public land to protect recreation and wildlife values on tracts of public land along the Bighorn River.	Same as Preferred.	No similar action.	Same as Preferred.
	Locatable mineral withdrawals would be pursued within 0.25 mile of the Legend Rock Petroglyph Site on about 630 acres of BLM-administered minerals, and in the immediate vicinity of rock art in the Meeteetse Draw area near Thermopolis.	No similar action.	No similar action.	Same as Preferred.
	A locatable mineral withdrawal would be pursued in the Absaroka Foothills on about 17,100 acres of public land to protect scenic values, wildlife habitat, soil, and water.	No similar action.	No similar action.	Same as Preferred.
Salable Minerals	Except for specific areas identified as closed, the planning area would be open to sale of mineral materials (for example, sand and gravel) and related exploration and development activities.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
Salable Minerals **(Continued)**	Topsoil would not be sold.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	The area within 0.5 mile of the Legend Rock Petroglyph Site would be closed to the sale of sand and gravel.	The area within three miles of the Legend Rock Petroglyph Site would be closed to the sale of sand and gravel.	Same as Preferred.	Same as Alternative A.
	The Meeteetse Draw rock art area would be closed to the development of salable minerals.	Same as Preferred.	Salable minerals could be developed on demand, subject to mitigation measures identified in site-specific environmental analyses.	Same as Preferred.
	The sale of sand and gravel would be avoided on public lands adjoining the Greybull and Bighorn rivers.	Same as Preferred.	No similar action.	Public lands adjoining the Greybull and Bighorn rivers would be closed to the sale of sand and gravel.
Geophysical	All parts of the planning area that are open to gas and oil leasing, exploration, and development would be open to geophysical exploration subject to appropriate mitigation requirements and constraints (Table 3). On lands where surface-disturbing activities would be prohibited (Table 3) or on lands closed to off-road vehicle travel, casual use geophysical exploration would be allowed. (Casual use for geophysical exploration is described in 43 CFR 3150.05(b).)	Same as Preferred.	Same as Preferred.	Same as Preferred.
OFF-ROAD VEHICLE MANAGEMENT	MANAGEMENT OBJECTIVE: Maintain or enhance opportunities for ORV use while avoiding adverse effects of vehicle travel on other resource values.	Same as Preferred.	Maintain or enhance opportunities for motorized recreation.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
OFF-ROAD VEHICLE MANAGEMENT (Continued)	MANAGEMENT ACTIONS: The Duck Swamp--Bridger Trail interpretive site and the rifle range on public land west of Worland would be designated as **closed** to vehicles. (See Map 15.)	Same as Preferred.	Same as Preferred.	Same as Preferred.
	No similar action.	Public lands near Sheep Mountain, Red Butte, Bobcat Draw Badlands, and the upper part of the South Fork of Owl Creek (about 52,460 acres) would be **closed** to ORV use. (See Map 16.)	No similar action.	No similar action.
	Public lands near Sheep Mountain, Red Butte, Bobcat Draw Badlands, and the upper part of the South Fork of Owl Creek (about 52,460 acres) would be managed as **closed** to ORV use until activity planning specifically addresses vehicle use in these areas.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	ORV use would be limited to **designated** roads and trails and limited seasonally on about 68,000 acres of public land in the Absaroka Mountain foothills.	Same as Preferred.	ORV use would be limited to **designated** roads and trails, and limited seasonally on about 9,500 acres of public land within part of the Absaroka Mountain foothills along the upper portion of Grass Creek. (See Map 17.)	Same as Preferred.
	ORV use would be limited to **designated** roads and trails on about 208,600 acres of public land in the Badlands SRMA.	No similar action.	No similar action.	Same as Preferred.
	ORV use would be limited to **designated** roads and trails on about 9,000 acres of public land in the Red Canyon Creek SRMA.	No similar action.	No similar action.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
OFF-ROAD VEHICLE MANAGEMENT (Continued)	ORV use in the Meeteetse Draw Rock Art area would be limited to **designated** roads and trails on about 6,800 acres of public land.	No similar action.	No similar action.	Same as Preferred.
	An open area for ORV "play" would be established west of Worland on about 900 acres.	Same as Preferred.	ORV open areas would be established west of Worland (900 acres) and near the town of Basin (2,780 acres).	Same as Preferred.
	Unless otherwise specified, vehicle use on BLM-administered public land would be limited to existing roads and trails.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	On areas designated as limited to "existing" roads and trails, the performance of necessary tasks requiring off-road use of a vehicle would be allowed provided resource damage does not occur. Examples of necessary tasks include constructing or repairing authorized range improvements.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	On areas designated as closed or limited to "designated" roads and trails, the off-road use of a vehicle on public lands would be prohibited unless the use were otherwise authorized by a permit or license. Signs would be posted and maps or brochures would be published to explain this requirement.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
OFF-ROAD VEHICLE MANAGEMENT (Continued)	Driving would be prohibited on wet soils and on slopes greater than 25 percent, if unnecessary damage to vegetation, soils, or water quality would result.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Over-the-snow vehicles would be subject to the same requirements and limitations as all other vehicles until activity planning specifically addresses their use.	Same as Preferred.	Same as Preferred.	Same as Preferred.
RECREATION MANAGEMENT	MANAGEMENT OBJECTIVE: Enhance opportunities for primitive recreation while increasing visitor services in some areas to meet needs for more developed forms of recreation.	Same as Preferred.	Increase visitor services to meet the demands of more developed forms of recreation.	Enhance the opportunities for primitive recreation.
	MANAGEMENT ACTIONS: SRMAs would be designated in the Absaroka Mountain foothills, Badlands, Bighorn River, and Red Canyon Creek areas. All other lands would be managed in an Extensive Recreation Management Area. Existing and proposed recreation management areas are shown on Map 18.	No SRMAs would be designated. All planning area lands would be managed in an Extensive Recreation Management Area.	SRMAs would be designated in the Badlands and Bighorn River areas. All other lands would be managed in an Extensive Recreation Management Area.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
RECREATION MANAGEMENT (Continued)	Recreational uses of BLM-administered lands along the Bighorn River for fishing, hunting, and float boating would be managed under the Bighorn River Habitat and Recreation Area Management Plan. Emphasis would be placed on acquisition of access to public lands on the Bighorn and Greybull rivers to enhance recreational opportunities and wildlife management.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Roadside geologic interpretive areas would be established near the Gooseberry Badlands, Red Canyon Creek, along Wyoming Highway 120, and in other areas.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	The existing Duck Swamp--Bridger Trail interpretive site would be maintained.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	The Legend Rock Petroglyph Site would be managed for public education in cooperation with the state of Wyoming.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	The development of a cooperative management agreement with private landowners would be emphasized to enhance conservation of the Legend Rock Petroglyph Site.	An exchange would be pursued to acquire privately-owned land at the Legend Rock Petroglyph Site.	No similar action.	Same as Preferred.
	In the Meeteetse Draw area, interpretive sites would be developed to highlight rock art, making use of scenic overlooks and interpretive signs and trails.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
RECREATION MANAGEMENT (Continued)	Portions of the town of Gebo and adjacent coal mining areas on public land would be managed for preservation and interpretation of cultural and historic values. Management could include actions like development of an interpretive road loop or roadside turnout.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Other cultural resource interpretive sites would be developed, making use of scenic overlooks, signs, and walking trails. Sites would include rock art and historic trails such as the Thermopolis to Meeteetse Trail, the Fort Washakie to Red Lodge Trail, the Mexican Pass Trail, and the Jim Bridger Trail.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	A scenic interpretive road loop would be developed in the Badlands area. This could include the Fifteenmile Creek, Dorsey Creek, and other roads, and an overlook at Painted Canyon.	No similar action.	Same as Preferred.	No similar action.
	BLM would enhance opportunities for the public to view wild horses in the Fifteenmile herd area.	Same as Preferred	No similar action.	Same as Preferred.
	Day use facilities would be established at Wardel and Harrington reservoirs. Camping sites would also be provided if demand warrants.	Same as Preferred.	Same as Preferred.	No similar action.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
RECREATION MANAGEMENT (Continued)	Trailheads would be developed for foot and horse travel in the Absaroka Mountain foothills. Potential locations would include the Blue Creek Trail and sites along the North and South Forks of Owl Creek and Rock Creek.	No similar action.	Same as Preferred.	No similar action.
	BLM would pursue trailheads in the Red Canyon Creek area consistent with an overall objective to emphasize primitive recreation.	Same as Preferred.	No similar action.	Same as Preferred.
	Development of a campground would be pursued near Wyoming 120 and Gooseberry Creek.	No similar action.	Same as Preferred.	No similar action.
	Trailheads, day use areas, and other recreational sites would be avoidance areas for surface-disturbing activities, although development of recreational facilities would not be avoided.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Recreation sites, recreation facility development, and recreational access would be managed to maintain or improve riparian habitat.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Posting information and directional signs would be necessary in some areas. Signs would be used to promote visitor use consistent with recreation and other resource management objectives.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
RECREATION MANAGEMENT (Continued)	Surface-disturbing and disruptive activities associated with the construction and use of roads, campgrounds, interpretive sites, and other recreational facilities would be subject to appropriate mitigation measures and constraints (Table 3).	Same as Preferred.	Same as Preferred.	Same as Preferred.
VEGETATION MANAGEMENT	MANAGEMENT OBJECTIVE: Maintain or improve the diversity of plant communities to support timber production; livestock and wild horse forage needs; wildlife habitat; watershed protection; and acceptable visual resources.	Same as Preferred.	Same as Preferred.	Same as Preferred.
General	MANAGEMENT ACTIONS: Surface-disturbing and disruptive activities associated with all types of vegetation management would be subject to appropriate mitigation measures and constraints (Table 3).	Same as Preferred.	Same as Preferred.	Same as Preferred.
Candidate and T&E Plants	The BLM would participate with The Nature Conservancy, U.S. Department of Interior Fish and Wildlife Service (FWS), and other agencies in the evaluation of areas for the potential transplant of protected plant species on BLM-administered lands.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
Noxious Weeds	Noxious weeds and other undesirable vegetation would be controlled in conjunction with counties, the U.S. Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS), and other agencies and affected interests, consistent with the Record of Decision for the Final EIS addressing Vegetation Treatment on BLM Lands in the 13 Western States (BLM 1991).	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Control of noxious weeds may include manual, mechanical, biological, or chemical methods. If herbicides are proposed for use, those with minimum toxicity to wildlife and fish would be selected. As appropriate, buffer zones would be provided along streams, rivers, lakes and riparian areas, including riparian areas along ephemeral and intermittent streams.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
Noxious Weeds **(Continued)**	Treatments would avoid bird nesting seasons and other times when loss of cover or disturbance by equipment would be detrimental to wildlife. Projects that may affect threatened or endangered plants or animals would be postponed or modified to protect the presence of these species. In such cases, BLM would consult with the FWS as required by the Endangered Species Act.	Same as Preferred.	Same as Preferred.	Same as Preferred.
Desired Plant Community (DPC) Objectives ***Standard Objective***	The following desired plant community (DPC) objective would be used unless specified otherwise: (See the Affected Environment section of this document for sample descriptions of the plant communities cited below. Desired plant communities are described according to the percentages of trees, shrubs, grasses, grasslikes, and forbs within each community. Descriptions are by weight estimate unless canopy cover percent is specified. Barren, alpine, and high gradient/rocky riparian communities are not discussed.) Salt Desert Shrub: shrubs 30-60%, grasses 30-60%, forbs 5-15%, with shrubs increasing on high saline sites. Salt Bottom: shrubs 20-40%, grasses 50-70%, forbs 5-15%	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
DPC Standard Objective **(Continued)**	Basin Grassland/Shrub: shrubs 10-20%, grasses 60-80%, forbs 10-20% Foothills-Mountain Grassland/Shrub: shrubs 10-30%, grasses 60-80%, forbs 10-20% Low Gradient/Alluvial Riparian Communities: Canopy Composition: shrubs 0-15%, grasses and grasslikes 70-90%, forbs 5-15% Intermediate Riparian Communities: Canopy Composition: trees and shrubs 10-30%, grasses and grasslikes 50-70%, forbs 10-30% Desert Cottonwood Riparian Communities: Canopy Composition: trees and shrubs 10-30%, grasses and grasslikes 50-70%, forbs 10-30% Woodlands: Same as Foothills-Mountain Grassland/Shrub on areas where invasion of limber pine and juniper has occurred on deeper soils. There is no specific objective where woodlands occur on very shallow soils.			

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
DPC Standard Objective **(Continued)**	Mixed Conifer/Deciduous Forest Communities: Promote overall species and structural diversity. Promote aspen growth in some areas, consistent with site-specific objectives for resource management, including timber management.			
DPC Objectives for Forestlands	General Objective: Maintain and enhance the health, productivity, and biological diversity of forest and woodland ecosystems. A balance of natural resource benefits would be provided to present and future generations. The management of forest and woodland resources would be consistent with ecosystem management principles.	General Objective: Manage forestlands for wildlife habitat, livestock forage, watershed protection, recreation, scenic quality, and commercial forest products.	General Objective: Manage forestlands for commercial forest products.	General Objective: Manage forestlands for noncommodity resources.
	Desired Plant Community Objective: Manage 80% of forestlands for hiding and thermal cover (50% of these stands would have thermal cover characteristics). Ten percent of the forestlands would be managed for old growth.	Desired Plant Community Objective: Same as Preferred.	Desired Plant Community Objective: Manage 60% of this community for hiding and thermal cover (50% of these stands would have thermal cover characteristics). Five to seven percent of the forestlands would be managed for old growth.	Desired Plant Community Objective: Manage 85% of this community for hiding and thermal cover (50% of these stands would have thermal cover characteristics). Twenty percent of the forestlands would be managed for old growth.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
DPC Objectives for Bighorn Sheep Habitat *Vegetation Requirements: Bighorn sheep require more shrubs for winter forage and more forbs for early spring grazing.*	General Objective: Manage up to 13,000 acres with emphasis on bighorn sheep habitat. Desired Plant Community Objective: Basin Grassland/Shrub and Foothills-Mountain Grassland/Shrub: shrubs 10-30%, grasses 40-70%, forbs 20-30%.	General Objective: Same as Preferred. Desired Plant Community Objective: Same as Preferred.	No similar objective.	General Objective: Same as Preferred. Desired Plant Community Objective: Same as Preferred.
DPC Objectives for Elk Winter Range *Vegetation Requirements: Wintering elk require a taller standing crop of grass to obtain forage in areas of deep snow.*	General Objective: Manage up to 76,000 acres for elk winter requirements on crucial winter ranges. Desired Plant Community Objective: Foothills-Mountain Grassland/Shrub: shrubs 10-30%, grasses 50-70%, forbs 10-30% Woodlands: On a site-specific basis, maintain or increase mature stands that provide hiding cover. Mixed Conifer/Deciduous: Increase acreage of aspen stands where feasible.	General Objective: Same as Preferred. Desired Plant Community Objective: Same as Preferred.	General Objective: Same as Preferred. Desired Plant Community Objective: Foothills-Mountain Grassland/Shrub: See standard DPC. Woodlands: On a site-specific basis, maintain the acreage of mature stands that provide hiding cover. Mixed Conifer/Deciduous: Increase acreage of aspen stands where this does not conflict with timber production.	General Objective: Manage up to 195,000 acres for elk winter requirements on winter and crucial winter ranges. Desired Plant Community Objective: Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
DPC Objectives for Elk Calving Habitat	General Objective: Manage up to 44,000 acres of habitat for elk reproductive success.	No similar objective.	No similar objective.	General Objective: Same as Preferred.
Vegetation Requirements: Lactating cow elk require a higher percentage of forbs in the late spring.	Desired Plant Community Objective: Foothills-Mountain Grassland/Shrub: shrubs 10-30%, grasses 50-70%, forbs 10-30% Woodlands: On a site-specific basis, maintain or increase mature stands that provide hiding cover. Mixed Conifer/Deciduous: Increase acreage of aspen stands where feasible.	(See standard DPC objective.)	(See standard DPC objective.)	Desired Plant Community Objective: Same as Preferred.
DPC Objectives for Moose Winter Range	General Objective: Manage up to 15,000 acres of habitat for moose winter requirements on crucial winter ranges.	General Objective: Same as Preferred.	General Objective: Same as Preferred.	General Objective: Manage up to 58,000 acres of habitat for moose winter requirements on winter and crucial winter ranges.
Vegetation Requirements: During winter and early spring, moose rely on woody vegetation that extends above the snow. Important nutrition is provided for lactating cow moose.	Desired Plant Community Objective: Mixed Conifer/Deciduous and Forest Communities: Increase acreage of aspen stands where feasible. All Riparian Communities: Maximize shrub and deciduous tree production.	Desired Plant Community Objective: Same as Preferred.	Desired Plant Community Objective: Same as Preferred, with the exception that forest stands with merchantable timber would be managed for conifer production.	Desired Plant Community Objective: Same as Preferred.
DPC Objectives for Moose Calving Habitat	General Objective: Manage up to 7,400 acres of habitat for moose reproductive success.	General Objective: Same as Preferred.	General Objective: Same as Preferred.	General Objective: Same as Preferred.
Vegetation Requirements: Same as above.	Desired Plant Community Objective: Mixed Conifer/Deciduous Communities: Increase acreage of aspen stands where feasible. Riparian Communities: Maximize shrub and deciduous tree production.	Desired Plant Community Objective: Same as Preferred.	Desired Plant Community Objective: Same as Preferred.	Desired Plant Community Objective: Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
DPC Objectives for Mule Deer Winter Range *Vegetation Requirements: Mule deer rely on the high nutritional value of shrubs during the winter. With the general lack of shrub diversity in the planning area, the shrubs in riparian areas are very important for winter survival.*	General Objective: Manage up to 304,000 acres of habitat for mule deer winter requirements on crucial winter ranges (outside the wild horse herd area where the standard DPC would be used).	General Objective: Same as Preferred.	No similar objective.	General Objective: Manage up to 508,000 acres of habitat for mule deer on winter, winter/yearlong, and crucial winter ranges (outside the wild horse herd area).
	Desired Plant Community Objective: Basin Grassland/Shrub and Foothills-Mountain Grassland/Shrub: shrubs 20-40%, grasses 40-60%, forbs 10-30%. Canopy openings should be less than 60 acres and shrub canopy cover should be 15-30%. All Riparian Communities: Enhance shrub and deciduous tree production.	Desired Plant Community Objective: Same as Preferred.	(See standard DPC objective.)	Desired Plant Community Objective: Same as Preferred.
DPC Objectives for Pronghorn Antelope Winter Range *Vegetation Requirements: Shrubs are important nutritionally and are available for consumption during the winter. During the winter, high quality forage is necessary to provide for good reproduction. However, if the sagebrush is too high, the ability of the pronghorn to see predators and to get through the brush is impaired.*	General Objective: Manage up to 111,000 acres for pronghorn antelope winter requirements on crucial winter ranges (outside the wild horse herd area).	General Objective: Same as Preferred.	No similar objective.	General Objective: Manage up to 461,000 acres for pronghorn antelope winter requirements on winter and crucial winter ranges.
	Desired Plant Community Objective: Basin Grassland/Shrub and Foothills-Mountain Grassland/Shrub: shrubs 20-40%, grasses 40-60%, forbs 10-30%. Canopy openings should be less than 60 acres, sagebrush over 30 inches tall is undesirable, and shrub canopy cover should be 15-30%.	Desired Plant Community Objective: Same as Preferred.	(See standard DPC objective.)	Desired Plant Community Objective: Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
DPC Objectives for Pronghorn Antelope Fawning Range *Vegetation Requirements: Early in the season, grasses and forbs provide important nutrition for does and fawns. An appropriate shrub density provides important hiding cover for the fawns.*	General Objective: Manage up to 4,700 acres of habitat for pronghorn antelope reproductive success.	No similar objective.	No similar objective.	General Objective: Same as Preferred.
	Desired Plant Community Objective: Basin Grassland/Shrub and Foothills-Mountain Grassland/Shrub: shrubs 20-40%, grasses 40-60%, forbs 10-30%. Canopy openings should be less than 60 acres, sagebrush over 30 inches tall is undesirable, and shrub canopy cover should be 15 to 30%.	(See standard DPC objective.)	(See standard DPC objective.)	Desired Plant Community Objective: Same as Preferred.
DPC Objectives for Sage Grouse Nesting Habitat *Vegetation Requirements: Sagebrush within two miles of sage grouse leks needs to cover 20 to 40 percent of the ground. A good forb understory provides nutritious spring feed for the young.*	General Objective: Manage up to 343,000 acres of habitat for sage grouse nesting success (outside the herd area).	General Objective: Same as Preferred.	No similar objective.	General Objective: Same as Preferred.
	Desired Plant Community Objective: Basin Grassland/Shrub and Foothills-Mountain Grassland/Shrub: shrubs 20-40%, grasses 40-60%, forbs 10-30%. Ideal canopy cover of sagebrush is 20%. Canopy openings should be less than 100 feet wide. Low Gradient Riparian: Canopy Composition: shrubs 0-15%, grasses and grasslikes 50-70%, and forbs 20-40%. Intermediate Gradient Riparian: Canopy Composition: shrubs 30-50%, grass and grasslike 20-40%, and forbs 20-40%.	Desired Plant Community Objective: Same as Preferred.	(See standard DPC objective.)	Desired Plant Community Objective: Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
VISUAL RESOURCE MANAGEMENT	MANAGEMENT OBJECTIVE: Maintain or improve scenic values throughout the planning area.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	MANAGEMENT ACTIONS: Visual resources would be managed in accordance with objectives for VRM classes that have been assigned to the planning area. Map 19 shows the VRM management areas.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Visual resources would be considered before authorizing land uses that may affect them. VRM requirements are applied on public lands or to BLM-approved mineral development on split-estate lands.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Facilities or structures such as power lines, oil wells, and storage tanks would be screened, painted, and otherwise designed to blend with the surrounding landscape.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Facilities or structures proposed in or near wilderness study areas would be designed so as not to impair wilderness suitability.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	The construction or modification of rights-of way would be addressed along important travel routes to Yellowstone Park, so that effects on scenic values are not increased.	To protect scenic values along major travel routes to Yellowstone Park, the placement of utility rights-of-way would be avoided along Wyoming highways 120 and 431.	Same as Preferred.	Same as Alternative A.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
WATERSHED MANAGEMENT	MANAGEMENT OBJECTIVES: Maintain or improve water quality to support state of Wyoming designated uses, and comply with state water quality standards. Reduce erosion by increasing ground cover, including vegetative litter, and maintain standing vegetation after grazing.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Improve watershed condition on about 274,000 acres of public land in the Fifteenmile Creek watershed, and reduce the overall level of sediment delivery to the Bighorn River from this area.	Same as Preferred.	No similar action.	Same as Preferred.
	By the end of calendar year 2005, increase properly functioning riparian areas from 50 percent of the total public land stream miles (in 1990) to 75 percent or more of these stream miles.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Reverse declining trend and stabilize or improve upland vegetation on about 15,000 acres to protect watershed and other resource values.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Improve watershed condition elsewhere in the planning area, especially on uplands in poor or fair ecological condition.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
WATERSHED MANAGEMENT (Continued)	MANAGEMENT ACTIONS: Watershed resources would be considered for BLM and industry-initiated projects. As needed, BLM conservation practices and state of Wyoming Best Management Practices would be applied to surface-disturbing activities.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Water wells and watershed projects that are no longer functioning or serving their original purposes would be reclaimed and abandoned as appropriate.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	The BLM may acquire mineral exploratory wells and drill holes that produce water. These acquired wells would be developed for multiple use purposes if they meet criteria for water well conversion.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	To obtain valid water rights, the BLM would file for the rights to water-related projects on public lands with the Wyoming State Engineer's office.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	To protect watershed values, roads and trails would be closed and reclaimed if they are heavily eroded or washed out, or if access roads in better condition are available.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
WATERSHED MANAGEMENT (Continued)	To protect watershed values, driving would be prohibited on wet soils and on slopes greater than 25 percent, if unnecessary damage to vegetation, soils, or water quality would result.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	In accordance with the 208 Statewide Water Quality Management Plan for Wyoming, BLM would cooperate with DEQ and EPA in the application of BLM conservation practices and state of Wyoming Best Management Practices to reduce sediment-caused water pollution in the Fifteenmile Creek Watershed.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	To reduce the amount of nonpoint pollution entering waterways, pollution prevention plans would be developed for actions that qualify under the Wyoming Storm Water Discharge Program.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	About 400 acres would be planted with native grasses to improve the condition of the Fifteenmile Creek Watershed. Livestock grazing would be deferred in these areas until the desired vegetation is established.	No similar action.	No similar action.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
WATERSHED MANAGEMENT (Continued)	Surface-disturbing and disruptive activities associated with watershed management would be subject to appropriate mitigation measures and constraints (Table 3).			
WILD HORSE MANAGEMENT	MANAGEMENT OBJECTIVE: In an expanded herd management area, maintain free-roaming wild horses in a thriving ecological balance.	In the Fifteenmile Wild Horse Herd Management Area (herd area), maintain free-roaming wild horses in a thriving ecological balance.	Manage the herd area for watershed and wildlife resources and livestock grazing use.	Same as Preferred.
	MANAGEMENT ACTIONS: The herd area would be increased by about 31,400 acres of public land north of the original herd area.	The herd area (Map 20) would keep its present size of about 83,130 acres.	Same as Alternative A.	Same as Preferred.
	The herd area would be managed for an initial herd size of at least 70 and no greater than 160 mature animals.	Same as Preferred.	Wild horses would not be maintained in the herd area. Horses would be placed elsewhere through adoption or transfer to other herd areas or phased out through fertility control.	Same as Preferred.
	Long-term wild horse numbers would be established through monitoring, multiple use allocations, and revision of the herd area activity plan.	Same as Preferred.	No similar action.	Same as Preferred.
	About 0.5 mile of "let-down" fence would be installed between the original and the expanded herd areas to control the distribution of cattle and allow movement by wild horses.	No similar action.	No similar action.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
WILD HORSE MANAGEMENT (Continued)	An existing gathering plan would be updated as necessary and implemented for roundups. Emphasis would be placed on gathering horses that wander outside the herd area or onto privately-owned lands.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Cooperative agreements or land exchanges to improve wild horse management would be pursued on about 16,000 acres of privately-owned land.	Land exchanges to improve wild horse management would be pursued on about 12,000 acres of privately-owned land.	No similar action.	Same as Preferred.
	Livestock grazing in the original herd area would be limited to November through March sheep use.	Same as Preferred.	No similar action.	Same as Preferred.
	Some cattle use would be allowed in two allotments (Tatman Common and Snyder), on the 31,400 acres of public land added to the herd area.	No similar action.	No similar action.	Same as Preferred.
	The standard DPC objective would be used in the original herd management area. (See section on Vegetation Management.)	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
WILD HORSE MANAGEMENT (Continued)	In the herd management area, grazing strategies would be designed to allow a combined forage utilization of 25 percent of the current year's growth, in Salt Desert Shrub and Salt Bottom plant communities that are grazed during the growing season. ***Information applicable to all alternatives on how utilization data would be collected and interpreted, is in Appendix 3.***	In the herd management area, grazing strategies would be designed to allow a combined forage utilization of 30 to 50 percent of the current year's growth, in Salt Desert Shrub and Salt Bottom plant communities that are grazed during the growing season.	In the herd management area, grazing strategies would be designed to allow a combined forage utilization of 25 to 35 percent of the current year's growth, in Salt Desert Shrub and Salt Bottom plant communities that are grazed during the growing season.	Same as Preferred.
	In the herd management area, grazing strategies would be designed to allow a combined forage utilization of 30 percent of the current year's growth in other plant communities that are grazed during the growing season.	In the herd management area, grazing strategies would be designed to allow a combined forage utilization of 30 to 50 percent of the current year's growth in other plant communities that are grazed during the growing season.	Same as Alternative A.	Same as Preferred.
	In the herd management area, combined forage utilization up to 40 percent of the current year's growth would be allowed in all plant communities that are grazed when plants are dormant.	In the herd management area, combined forage utilization up to 60 percent of the current year's growth would be allowed in all plant communities that are grazed when plants are dormant.	Same as Alternative A.	Same as Preferred.
	Wild horses would be allocated 2,300 AUMs of forage annually.	Same as Preferred.	No similar action.	Same as Preferred.
	Total forage use by domestic livestock in the original herd area would not be allowed to exceed 3,370 AUMs per year.	Same as Preferred.	Total forage use by domestic livestock in the original herd area would not be allowed to exceed 7,925 AUMs per year.	Same as Preferred.
	On the 31,400 acres added to the herd area, total forage use by domestic livestock would not be allowed to exceed 3,590 AUMs per year.	No similar action.	No similar action.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
WILD HORSE MANAGEMENT (Continued)	The BLM would pursue development of additional water sources in the herd area to improve horse distribution and manage forage utilization.	Same as Preferred.	Development of additional water sources would be pursued to benefit livestock and wildlife needs.	Same as Preferred.
	The BLM would enhance opportunities for the public to view wild horses in the Fifteenmile herd area.	Same as Preferred.	No similar action.	Same as Preferred.
	Surface-disturbing and disruptive activities associated with wild horse management would be subject to appropriate mitigation measures and constraints (Table 3).	Same as Preferred.	Same as Preferred.	Same as Preferred.
WILDLIFE AND FISH HABITAT MANAGEMENT	MANAGEMENT OBJECTIVE: Maintain or enhance wetland habitat for wildlife and fish, maintain or enhance habitat for existing and WGFD "objective" wildlife populations, promote species diversity, and allow the expansion of wildlife and fish where appropriate.	Maintain or enhance wetland and upland habitat for wildlife and fish, maintain or enhance habitat for existing and WGFD "objective" wildlife populations, and promote species diversity.	Maintain existing habitat for wildlife and fish populations.	Maintain or enhance wetland habitat for wildlife and fish, maintain or enhance habitat for existing and WGFD "objective" wildlife populations, promote species diversity, and allow the expansion of wildlife and fish into high potential habitats.
General	MANAGEMENT ACTIONS: The Absaroka Front Habitat Management Plan, the Bighorn River Habitat Management Plan, the Stream Habitat Management Plan, and the Reservoir Habitat Management Plan would be revised as necessary and implemented.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
WILDLIFE AND FISH HABITAT MANAGEMENT (Continued)	Annual review and environmental analysis of insect infestations would be conducted with APHIS and control measures would be performed as needed.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Surface-disturbing and disruptive activities associated with wildlife and fish management would be subject to appropriate mitigation measures and constraints (Table 3).	Same as Preferred.	Same as Preferred.	Same as Preferred.
Wildlife Habitat	To the extent possible, suitable habitat and forage would be provided to support wildlife populations defined in the 1989 WGFD Strategic Plan objectives. Requests by WGFD to change the objectives would be considered, based on habitat capability and availability.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	BLM would participate with the FWS in the evaluation and designation of critical habitat for threatened or endangered species on BLM-administered lands. If proposed surface-disturbing or disruptive activities could affect these species, BLM would consult with the FWS as required by the Endangered Species Act.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
Wildlife Habitat **(Continued)**	The BLM would continue to work with the USDA Forest Service (FS), FWS, WGFD, and the Wind River Indian Reservation tribes in developing a healthy bighorn sheep herd in the Absaroka and Owl Creek mountains.	Same as Preferred.	No similar action.	Same as Preferred.
	Nest sites, roosts, cottonwood trees, and other potential critical habitats related to hunting and concentration areas for bald eagles would be protected, especially along the Bighorn and Greybull rivers. As one measure to protect these habitats, firewood harvesting would be prohibited in these areas.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	BLM would participate with the FWS and WGFD in the evaluation of habitat areas for the potential transplant of protected fish and wildlife species on public lands.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
Wildlife Habitat **(Continued)**	Fences on public land that are hindering natural movement of wildlife would be modified. Fence modifications would conform to standards outlined in BLM Manual Sections 1741 and 9170. Priority would be given to fences that are restricting the greater numbers of wildlife in, or near, calving and fawning areas or crucial winter areas. Affected parties would be consulted before fence modification to ensure a mutual understanding of the need for the change and for establishing acceptable fence standards.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Fences would be constructed with the objective of maintaining or improving wildlife mobility in important habitat areas.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Animal control measures directed at coyotes and other predators would be evaluated by BLM, APHIS, and affected public land users, before implementation.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Emphasis would be placed on acquisition of access to public lands on the Bighorn and Greybull rivers to enhance recreational opportunities and wildlife management.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
Wildlife Habitat **(Continued)**	Exchanges would be pursued to improve management of important seasonal wildlife habitat areas in the upper portions of Owl, Cottonwood, Gooseberry, and Grass creeks.	Same as Preferred.	No similar action.	Same as Preferred.
	Exchanges would be pursued along Gooseberry Creek, the upper portions of Cottonwood and Grass creeks, the Bighorn and Greybull rivers, and on lands where other wetland/riparian areas occur. The purpose of these exchanges would be to block up public land, enhance public access, and improve management.	Same as Preferred.	No similar action.	Same as Preferred.
	Waterfowl nesting and rearing habitat would be improved on suitable reservoirs.	Duck nesting and rearing habitat would be improved on about 100 reservoirs to regularly produce ducklings during normal and wet years. Goose production habitat would be expanded by the modification of at least five suitable reservoirs to meet nesting and rearing needs.	No similar action.	Same as Preferred.
	BLM would encourage the construction of islands in reservoirs, encourage the growth of riparian vegetation by plantings and/or grazing management, and install nesting structures to manage for waterfowl production and security areas near reservoirs.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
Fish Habitat	BLM would cooperate with the WGFD and local irrigators in negotiations directed at establishing minimum pool elevations for reservoirs having fisheries potential. Reservoirs currently being considered include Wardel Reservoir and Harrington Reservoir.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Reservoirs and riparian areas would be maintained to improve or enhance potential fisheries. The BLM would encourage the design of reservoirs to enhance fisheries where potential exists.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Consistent with the overall management objective to maintain or enhance fisheries habitat, existing game and nongame fish habitat would be protected and BLM would consider the introduction of fish where habitat potential exists. Approximately 28 miles of stream habitat would be managed for game fish; 60 additional miles would be managed for nongame fish.	Same as Preferred.	Consistent with the overall management objective to maintain existing fisheries resources, game fish habitat on 22.5 miles of stream and nongame fish habitat on 31 miles would be protected.	Same as Preferred.
SPECIAL MANAGEMENT AREAS ***Fifteenmile Creek Watershed***	An Area of Critical Environmental Concern (ACEC) would be designated in the Fifteenmile Creek Watershed on about 274,300 acres of public land. (See Map 21). The special management designation would not apply to state or private lands.	No similar action.	No similar action.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
Fifteenmile Creek Watershed **(Continued)**	Management would include the use of BLM conservation practices, planting of native grasses in parts of the watershed, reclamation or rehabilitation of reservoirs and sediment detention structures that are no longer serving their original purpose, and cooperative management of watershed concerns with the state of Wyoming, local government, private landowners, grazing permittees, and other affected individuals and groups. (Also see WATERSHED MANAGEMENT section.)	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Based on the ACEC designation, a "plan of operations" would be required for all mining claim-related activities other than casual use in the Fifteenmile Creek Watershed.	No similar action.	No similar action.	Same as Preferred.
Meeteetse Draw Rock Art Area	An ACEC would be designated in the Meeteetse Draw area to protect rock art associated with Native American cultural values on about 6,800 acres of public land. The special management designation would not apply to state or private lands.	Same as Preferred.	No similar action.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
Meeteetse Draw Rock Art Area **(Continued)**	Management would include developing interpretive sites to highlight rock art, pursuing additional legal public access, and closing some areas to the staking and development of mining claims. (Also see CULTURAL, PALEONTOLOGICAL, AND NATURAL HISTORY RESOURCES MANAGEMENT section.)	Management would include developing interpretive sites to highlight rock art and pursuing additional legal public access.	Management would include developing interpretive sites to highlight rock art.	Same as Preferred.
	Based on the ACEC designation, a "plan of operations" would be required for all mining claim-related activities other than casual use in the Meeteetse Draw area.	Same as Preferred.	No similar action.	Same as Preferred.
Upper Owl Creek Area	An Area of Critical Environmental Concern (ACEC) would be designated in the upper Owl Creek area on about 17,100 acres of public land. The special management designation would not apply to state or private lands.	No similar action.	No similar action.	Same as Preferred.
	Management would include limiting or prohibiting surface-disturbing activities and closing the area to the staking and development of mining claims to protect fragile soils, alpine tundra, important wildlife habitat, and scenic values. (Also see TABLE 3 -- CONSTRAINTS ON SURFACE-DISTURBING ACTIVITIES.)	Management would include limiting or prohibiting surface-disturbing activities.	Management would include some limits on surface-disturbing activities.	Same as Preferred.

TABLE 2 -- COMPARISON OF ALTERNATIVES

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
Upper Owl Creek Area **(Continued)**	Based on the ACEC designation, a "plan of operations" would be required for all mining claim-related activities other than casual use in the upper Owl Creek area.	No similar action.	No similar action.	Same as Preferred.

TABLE 3 -- CONSTRAINTS ON SURFACE-DISTURBING ACTIVITIES

LANDS OR RESOURCES TO BE PROTECTED	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
MISCELLANEOUS RESOURCES	Based on site-specific environmental analyses, surface-disturbing activities would be limited during wet weather periods, on frozen soils, and on slopes greater than 25%; visual impacts would be mitigated in scenic areas (visual resource management [VRM] class I and II areas); surface-disturbing activities would be prohibited within 500 feet of surface water and(or) riparian areas; and surface-disturbing activities would be avoided in the immediate vicinity of significant cultural and paleontological resource sites, and within 0.25 mile or within view (whichever is closer) of rock art and significant segments of historic trails.	Same as Preferred.	Same as Preferred.	Same as Preferred.
CULTURAL RESOURCES	Sand and gravel mining would be prohibited within 0.5 mile of the Legend Rock Petroglyph Site. (This would correspond to a No Surface Occupancy stipulation for gas and oil leasing.)	Sand and gravel mining would be prohibited within 3 miles of the Legend Rock Petroglyph Site. (This would correspond to a No Surface Occupancy stipulation for gas and oil leasing.)	Same as Preferred.	Same as Preferred.

TABLE 3 -- CONSTRAINTS ON SURFACE-DISTURBING ACTIVITIES

LANDS OR RESOURCES TO BE PROTECTED	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
LANDS LEASED FOR RECREATION AND PUBLIC PURPOSES	Surface-disturbing activities, with the exception of activities authorized by Recreation and Public Purposes Leases, would be prohibited at the Holly Sugar Receiving Station (beet dump) at Basin; at the Thermopolis, Worland, and Big Horn County landfills; and at the Worland Rifle Range. (This would correspond to a No Surface Occupancy stipulation for gas and oil leasing.)	Same as Preferred.	Same as Preferred.	Same as Preferred.
WILDLIFE RESOURCES	Unless site-specific environmental analyses demonstrate that adverse effects can be mitigated or avoided, surface-disturbing or disruptive activities would be prohibited during certain periods of the year on specific big game crucial winter ranges and birthing areas, in suitable breeding and nesting habitat areas within 2 miles of the center of sage grouse leks, and within 0.5 mile of raptor nests or within view of nests, whichever is closer. (This would correspond to a Timing Limitation stipulation for gas and oil leasing.)	Same as Preferred.	No similar action.	Same as Preferred.

TABLE 3 -- CONSTRAINTS ON SURFACE-DISTURBING ACTIVITIES

LANDS OR RESOURCES TO BE PROTECTED	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
WILDLIFE RESOURCES (Continued)	Unless site-specific environmental analyses demonstrate that adverse effects can be mitigated or avoided, surface-disturbing or disruptive activities would be prohibited on overlapping and important big game crucial winter ranges, migration corridors, and birthing areas. (This would correspond to a Controlled Surface Use stipulation for gas and oil leasing.)	Same as Preferred.	Unless site-specific environmental analyses demonstrate that adverse effects can be mitigated or avoided, surface-disturbing or disruptive activities would be prohibited during November through June on overlapping and important big game crucial winter ranges, migration corridors, and birthing areas. (This would correspond to a Timing Limitation stipulation for gas and oil leasing.)	Surface-disturbing or disruptive activities would be prohibited on overlapping and important big game crucial winter ranges, migration corridors, and birthing areas. (This would correspond to a No Surface Occupancy stipulation for gas and oil leasing.)
	Unless site-specific environmental analyses demonstrate that adverse effects can be mitigated or avoided, surface-disturbing activities would be prohibited within 0.25 mile of Wardel and Harrington reservoirs. (This would correspond to a Controlled Surface Use stipulation for gas and oil leasing.)	Same as Preferred.	No similar action.	Surface-disturbing activities would be prohibited within 0.25 mile of Wardel and Harrington reservoirs. (This would correspond to a No Surface Occupancy stipulation for gas and oil leasing.)
	In sage grouse complex areas, surface-disturbing and disruptive activities would be allowed within 0.25 mile of the center of individual leks subject to resource condition objectives described in the next row. (Sage grouse complex areas, including lek centers and adjacent habitat, are described in Chapter 3.)	No similar action.	No similar action.	Same as Preferred.

TABLE 3 -- CONSTRAINTS ON SURFACE-DISTURBING ACTIVITIES

LANDS OR RESOURCES TO BE PROTECTED	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
WILDLIFE RESOURCES (Continued)	In sage grouse complex areas, BLM would maintain an objective to limit total surface disturbance to less than 20% of the total habitat area. The 20% objective would include habitat affected by direct surface-disturbance and areas affected by indirect, human presence activities. For example, an eighth of a mile on each side of a road or a quarter of a mile around a gas well would be considered indirect disturbance. (This would correspond to a Controlled Surface Use stipulation for gas and oil leasing.)	No similar action.	No similar action.	Same as Preferred.
	Within 0.25 mile of other leks (not in complexes), surface-disturbing or disruptive activities would be prohibited unless site-specific environmental analyses demonstrate that adverse effects can be mitigated or avoided. (This would correspond to a Controlled Surface Use stipulation for gas and oil leasing.)	No similar action.	No similar action.	Within 0.25 mile of other leks (not in complexes), surface-disturbing or disruptive activities would be prohibited. (This would correspond to a No Surface Occupancy stipulation for gas and oil leasing.)

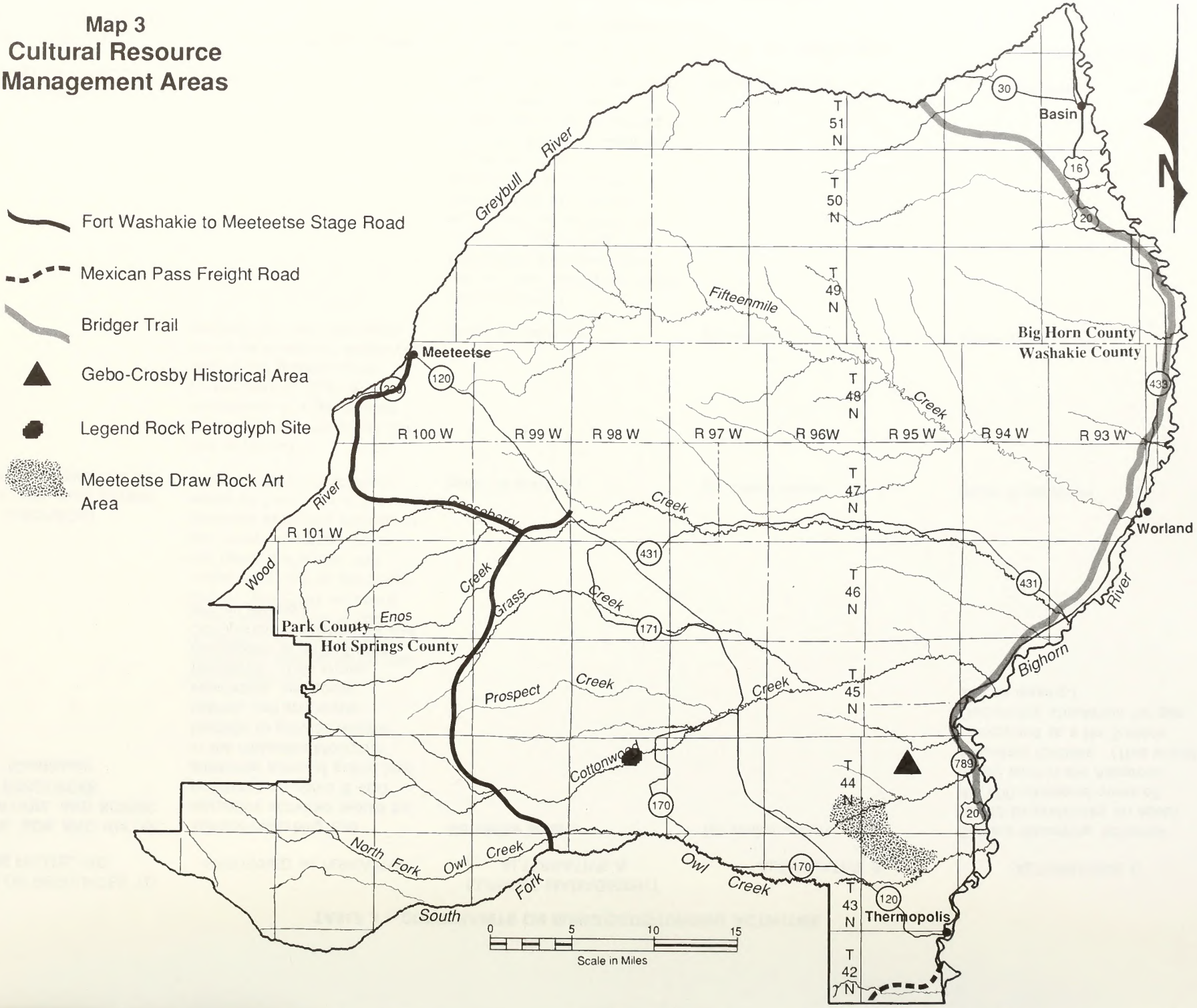
TABLE 3 -- CONSTRAINTS ON SURFACE-DISTURBING ACTIVITIES

LANDS OR RESOURCES TO BE PROTECTED	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
WILDLIFE RESOURCES (Continued)	No similar action.	Within 0.25 mile of the center of all sage grouse leks, surface-disturbing or disruptive activities would be prohibited unless site-specific environmental analyses demonstrate that adverse effects can be mitigated or avoided. (This would correspond to a Controlled Surface Use stipulation for gas and oil leasing.)	No similar action.	No similar action.
	Surface-disturbing activities would be prohibited within 0.5 mile of the Bighorn River (1,200 acres). (This would correspond to a No Surface Occupancy stipulation for gas and oil leasing.)	Same as Preferred.	No similar action.	Same as Preferred.
WILDLIFE, SOIL AND WATER, VEGETATION, AND SCENIC RESOURCES	Surface-disturbing activities would be prohibited in the Absaroka Mountain foothills in the vicinity of Castle Rocks and Mudstone Ridge; and within 0.25 mile of the South Fork of Owl Creek on about 8,900 acres. (This would correspond to a No Surface Occupancy stipulation for gas and oil leasing.)	Same as Preferred.	No similar action.	Same as Preferred.

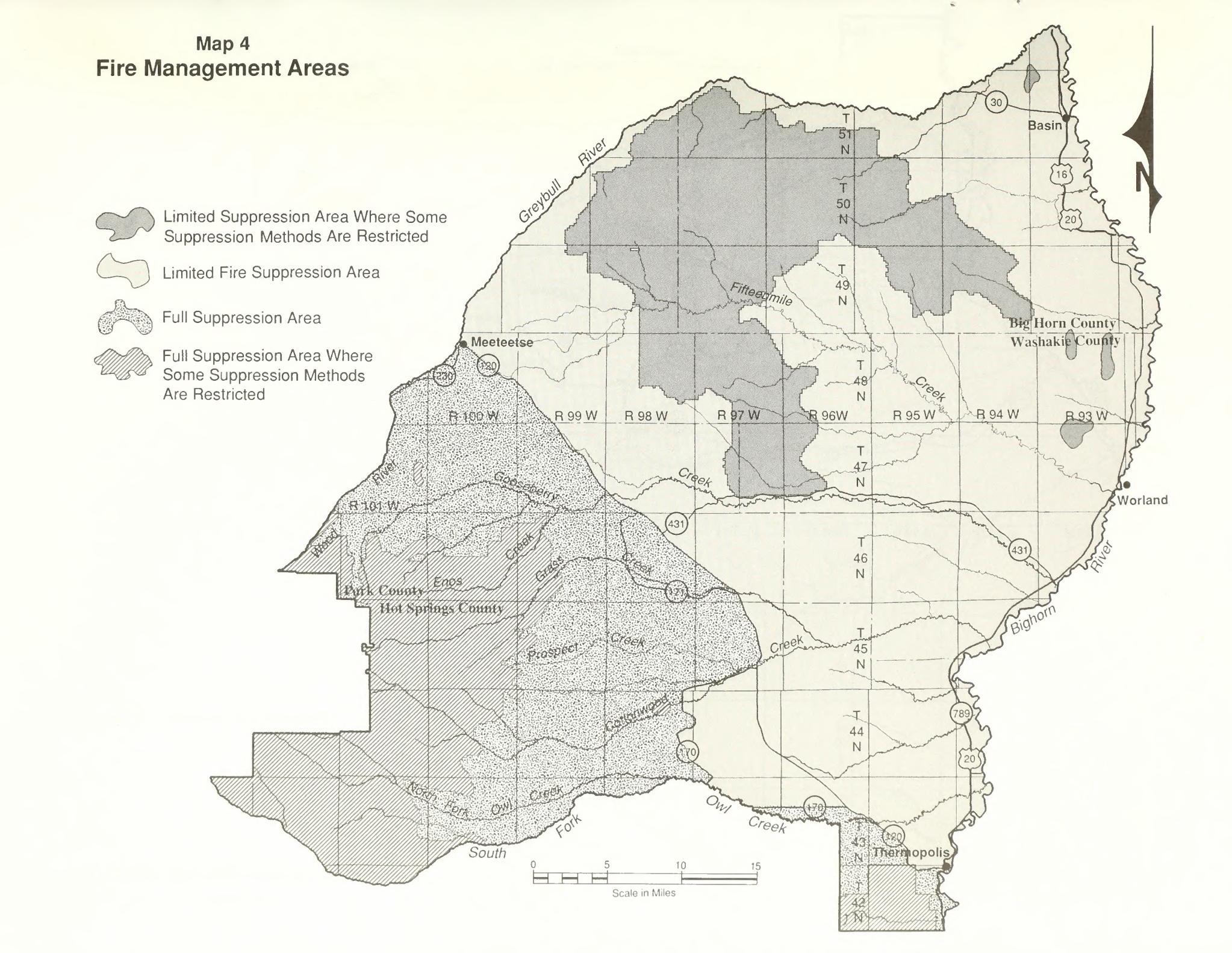
TABLE 3 -- CONSTRAINTS ON SURFACE-DISTURBING ACTIVITIES

LANDS OR RESOURCES TO BE PROTECTED	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
WILDLIFE, SOIL AND WATER, VEGETATION, AND SCENIC RESOURCES (Continued)	Surface-disturbing and disruptive activities would be prohibited on about 9,400 additional acres of public land in the Absaroka Mountain foothills to protect wildlife habitat, soil and water, vegetation, and scenic resources. (This would correspond to a No Surface Occupancy stipulation for gas and oil leasing.)	No similar action.	No similar action.	Surface-disturbing activities would be prohibited on about 49,700 additional acres of public land in the Absaroka Mountain foothills. (This would correspond to a No Surface Occupancy stipulation for gas and oil leasing.)

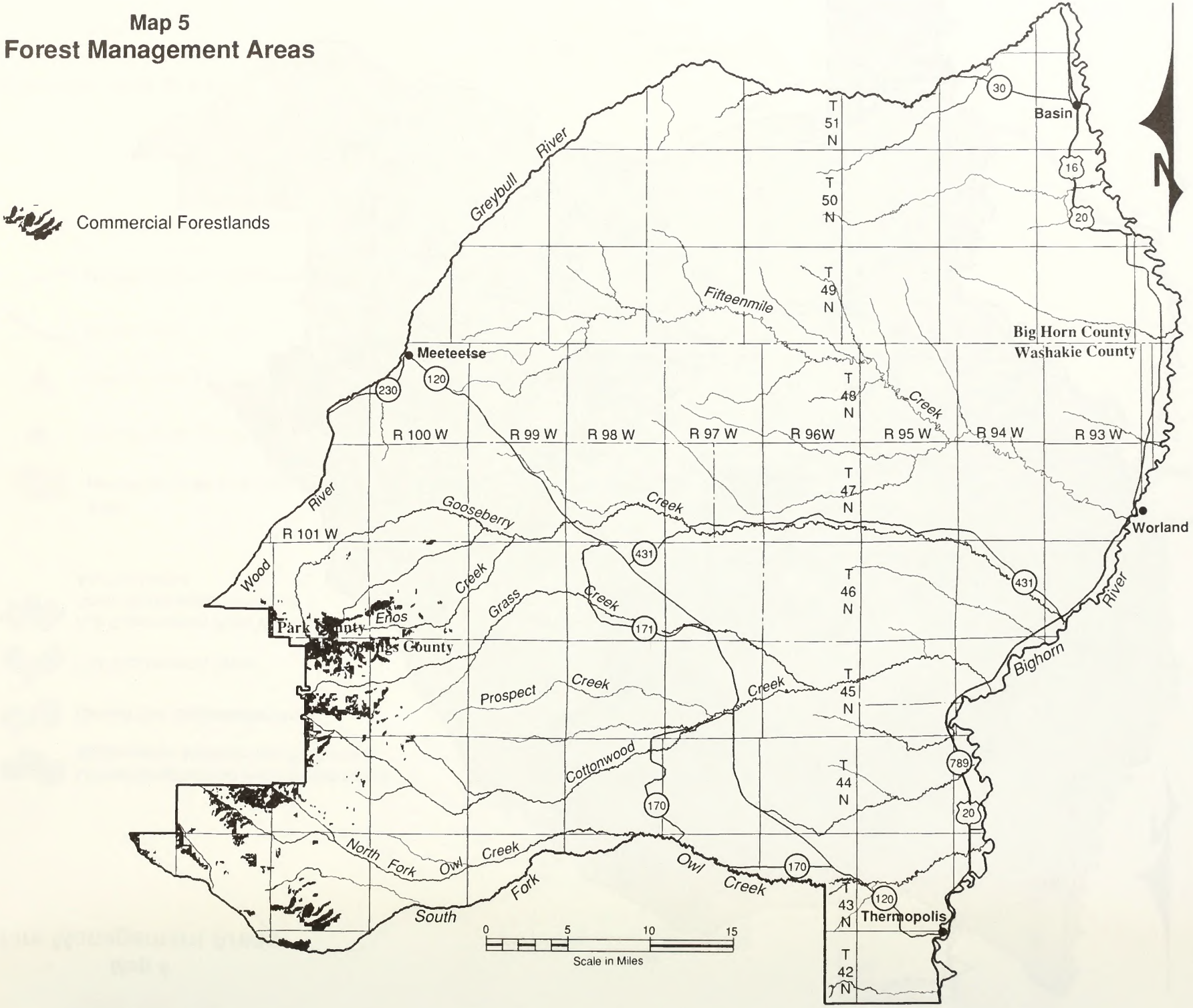
Map 3
Cultural Resource Management Areas



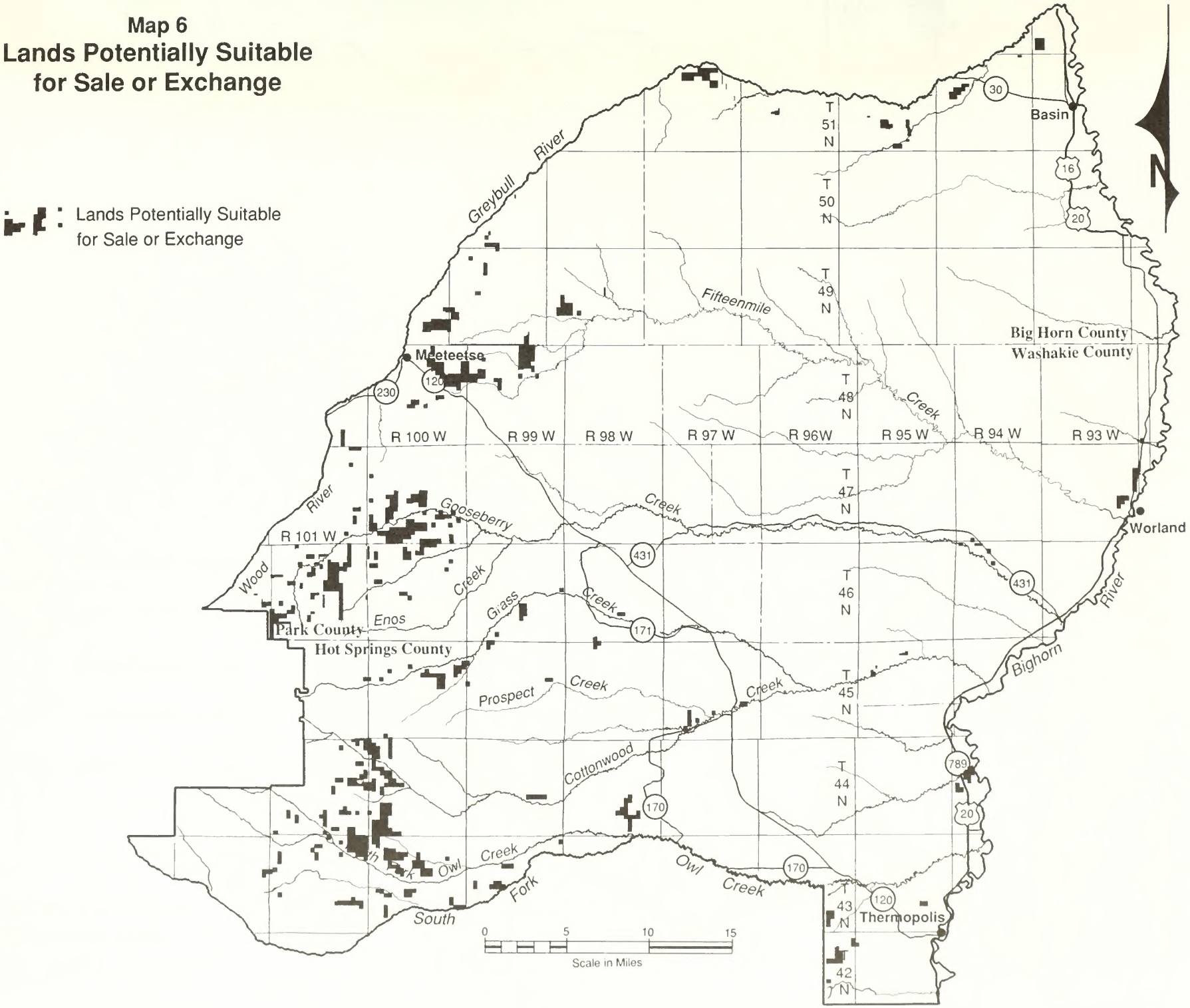
Map 4
Fire Management Areas



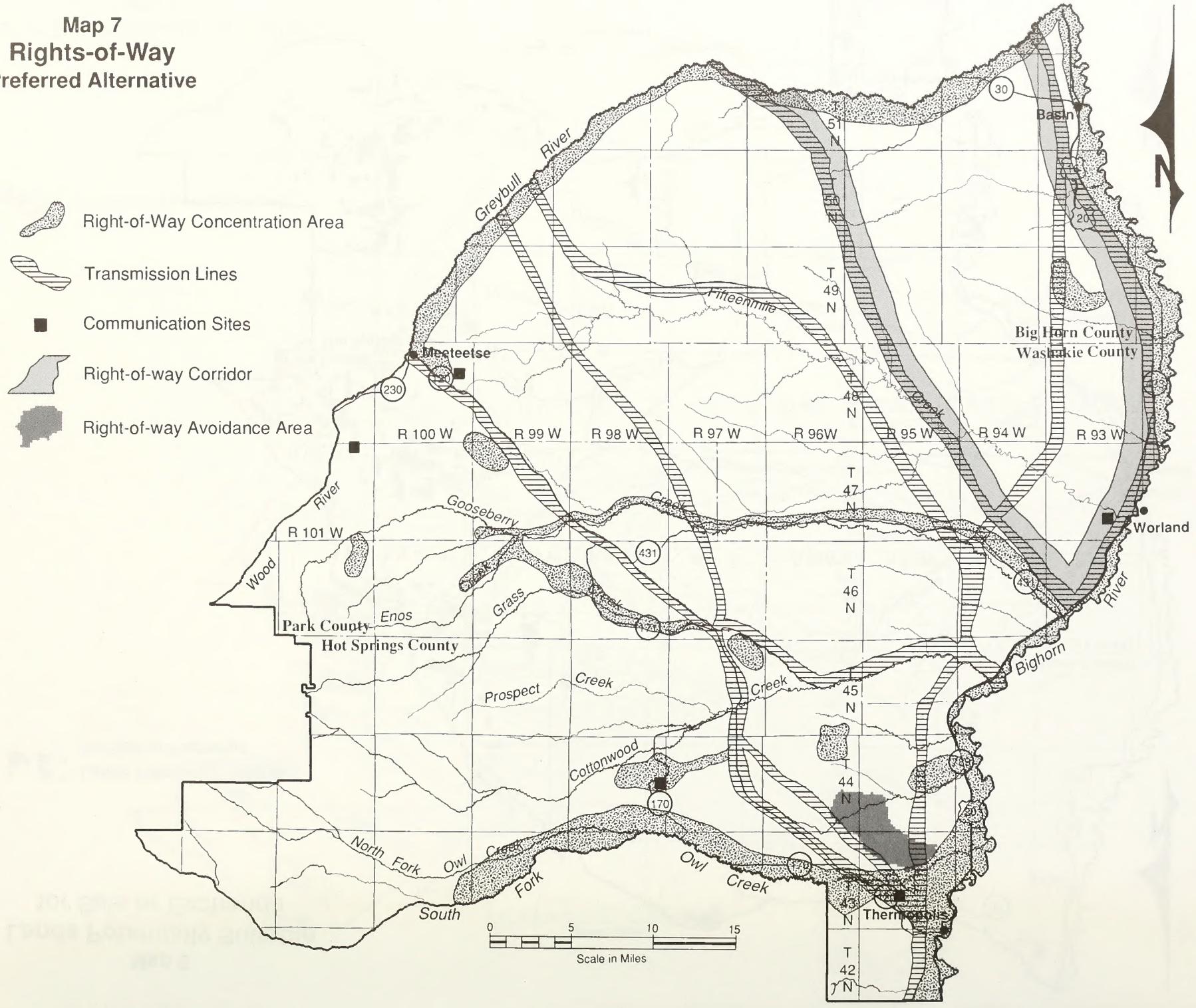
Map 5
Forest Management Areas



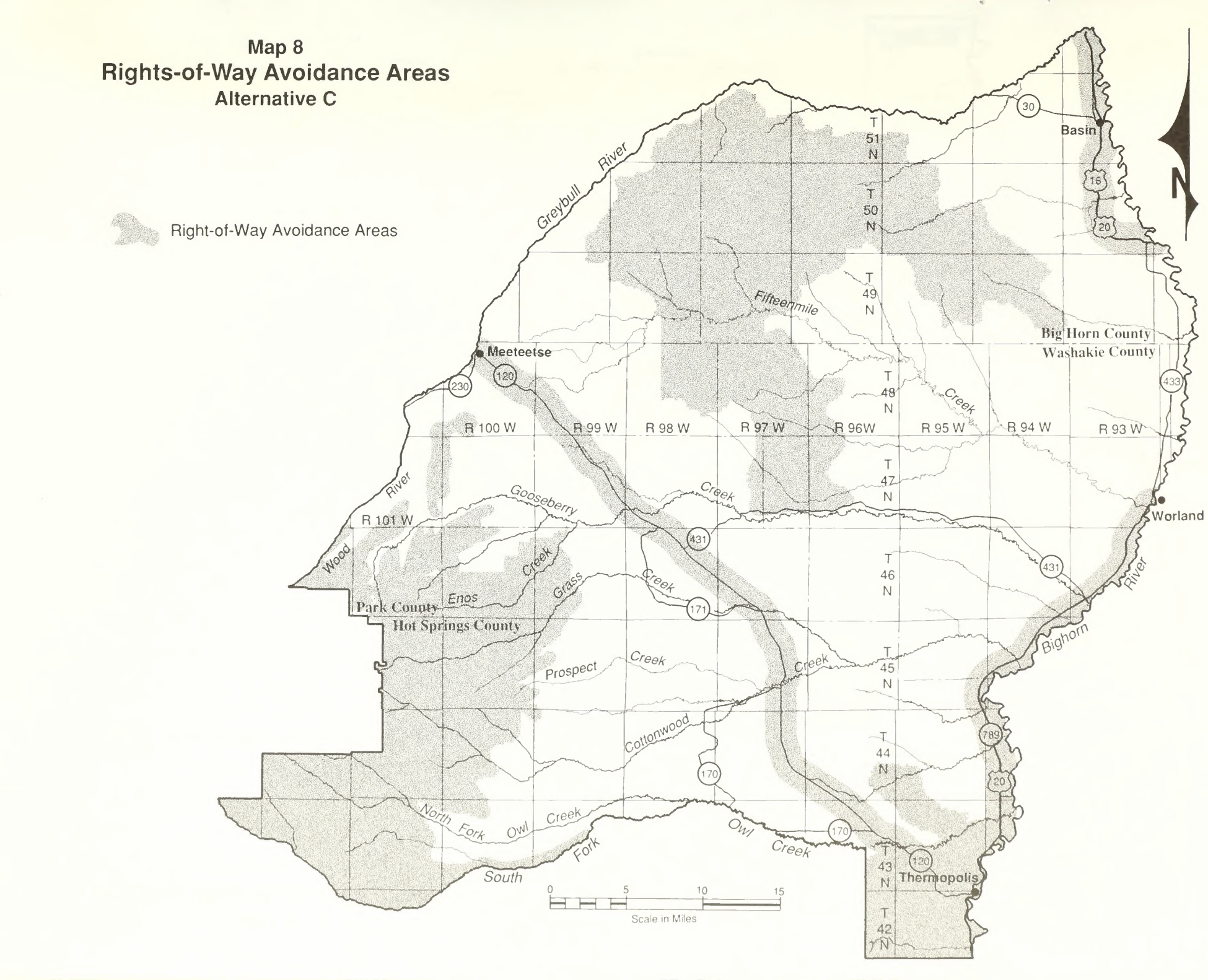
Map 6
Lands Potentially Suitable for Sale or Exchange



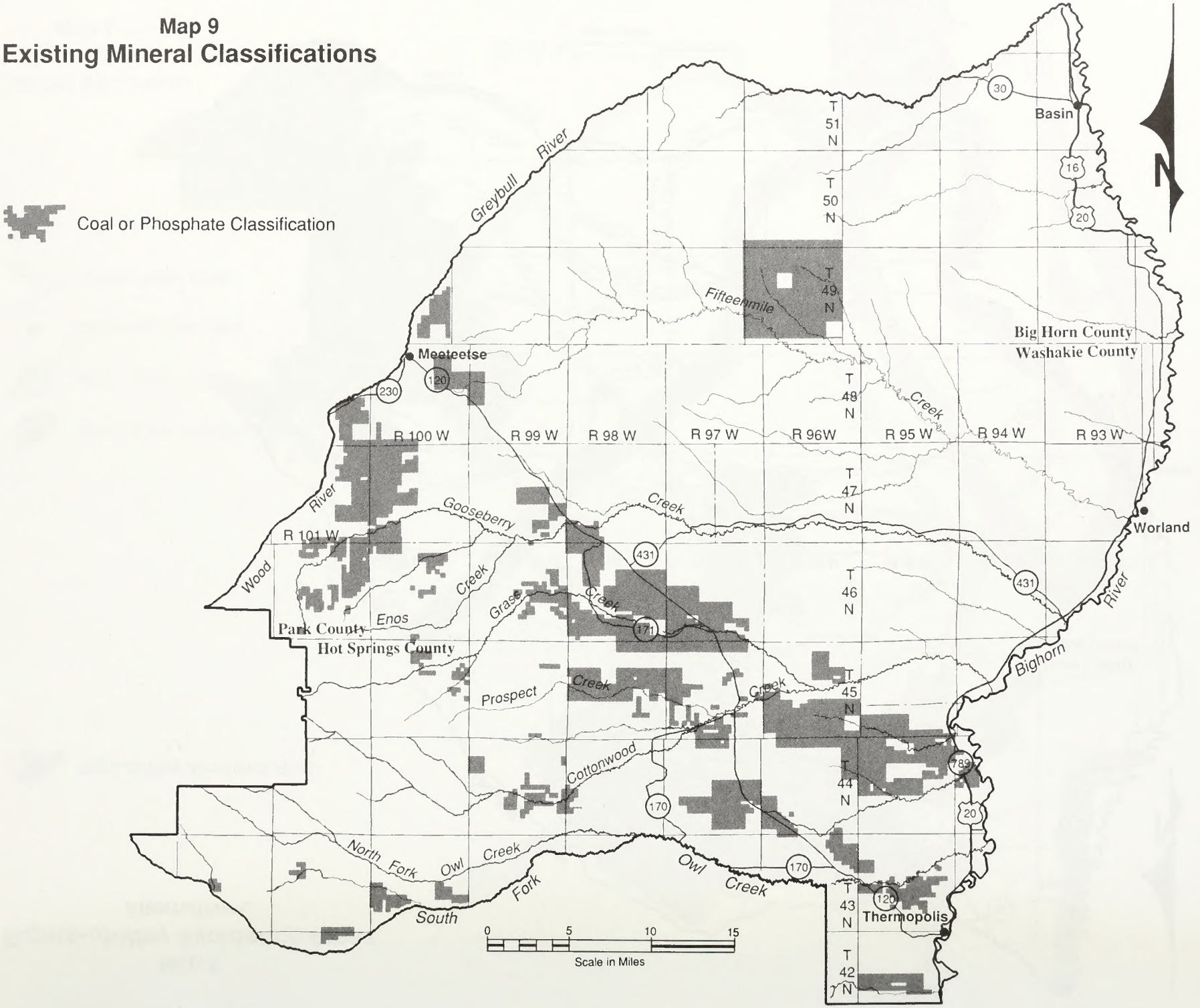
Map 7
Rights-of-Way
Preferred Alternative



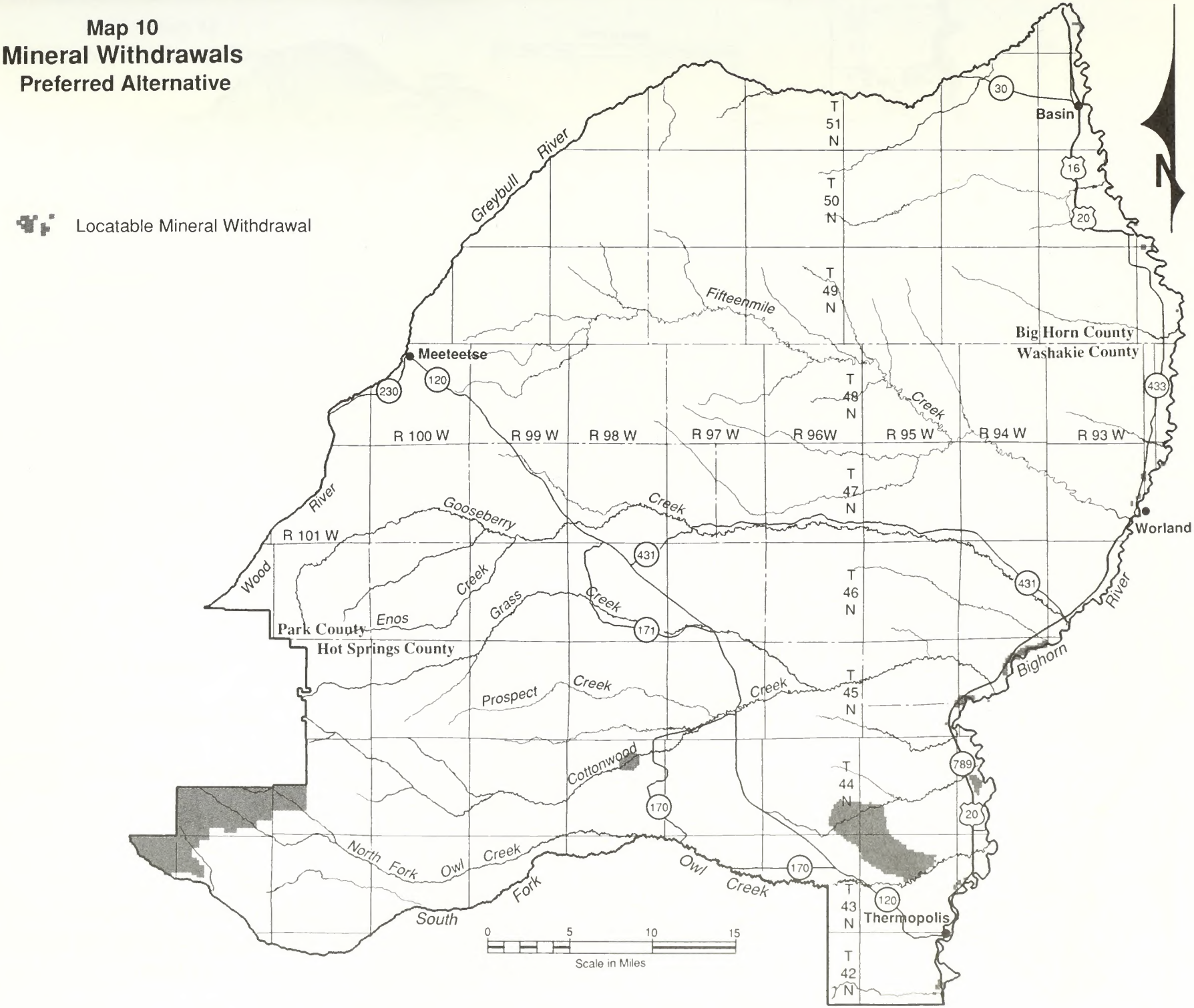
Map 8
Rights-of-Way Avoidance Areas
Alternative C



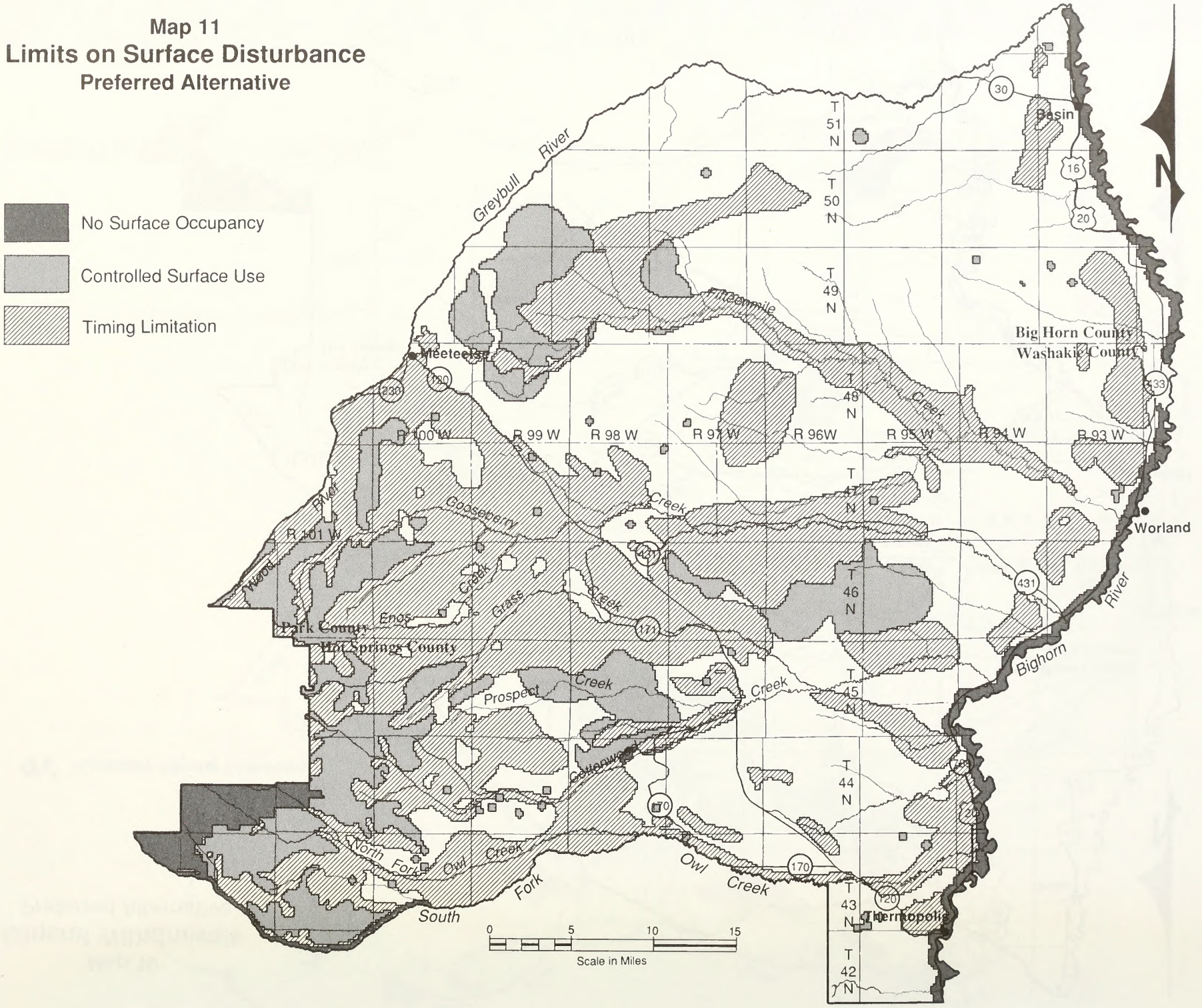
Map 9
Existing Mineral Classifications



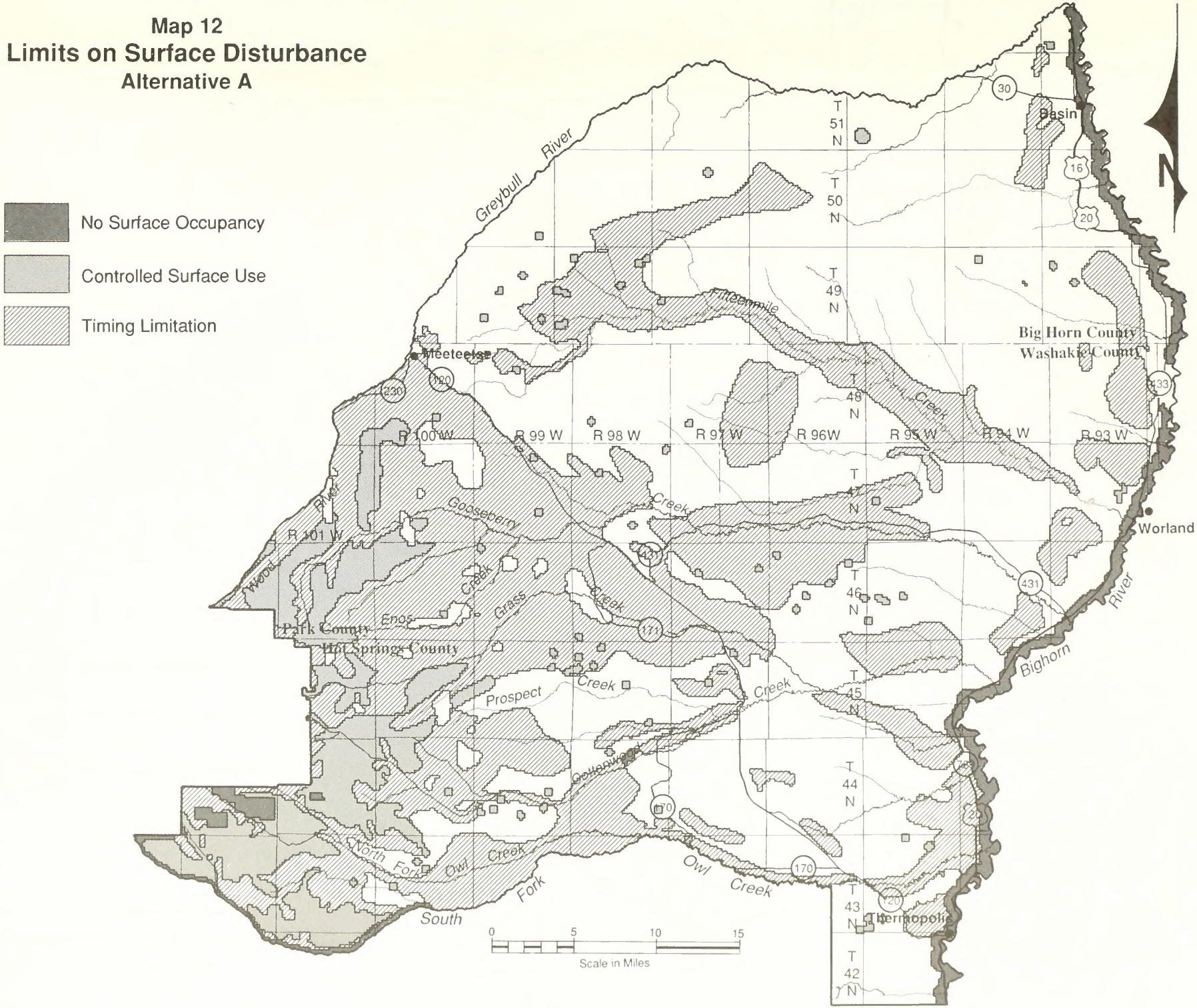
Map 10
Mineral Withdrawals
Preferred Alternative



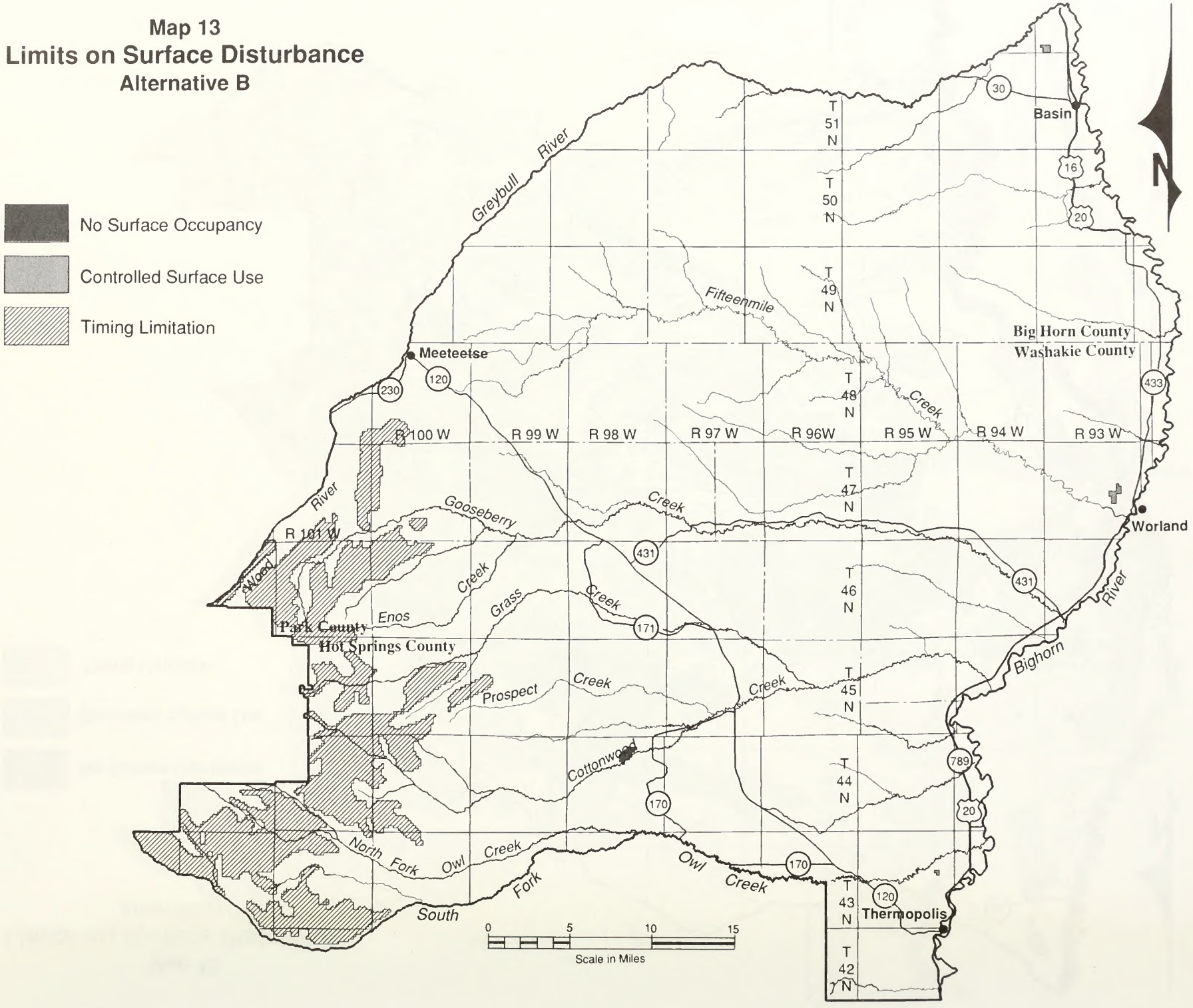
Map 11
Limits on Surface Disturbance
Preferred Alternative



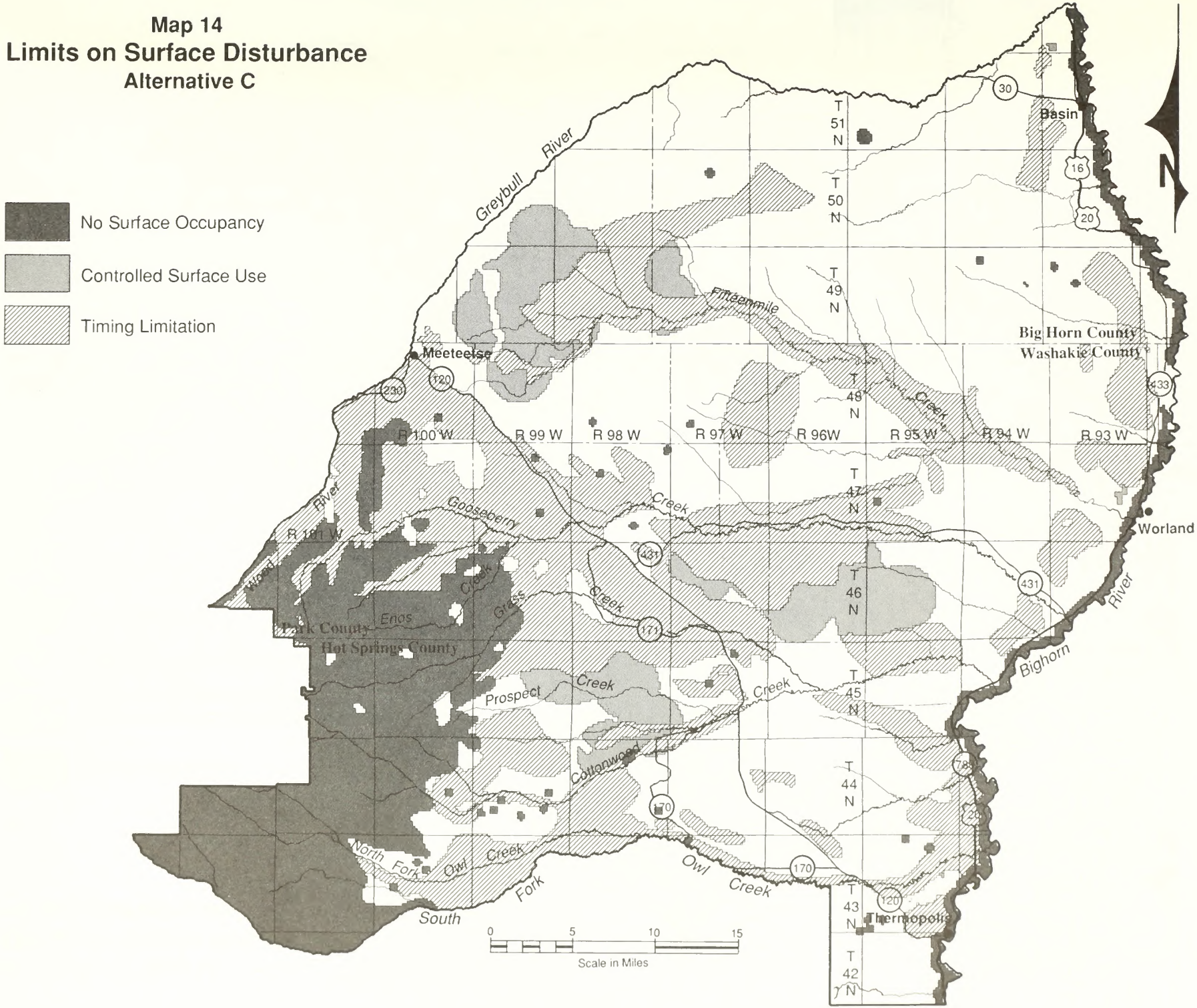
Map 12
Limits on Surface Disturbance
Alternative A



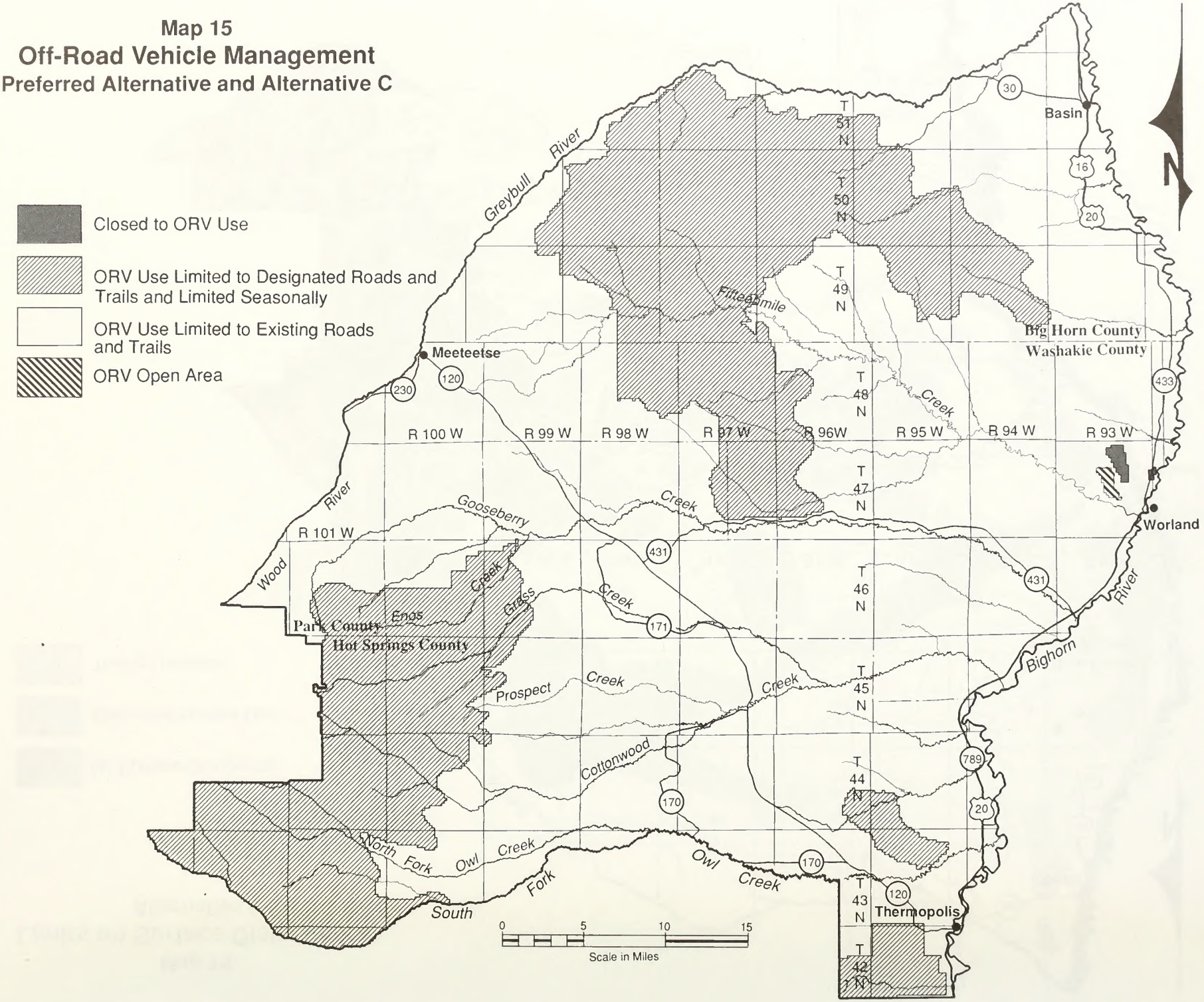
Map 13
Limits on Surface Disturbance
Alternative B



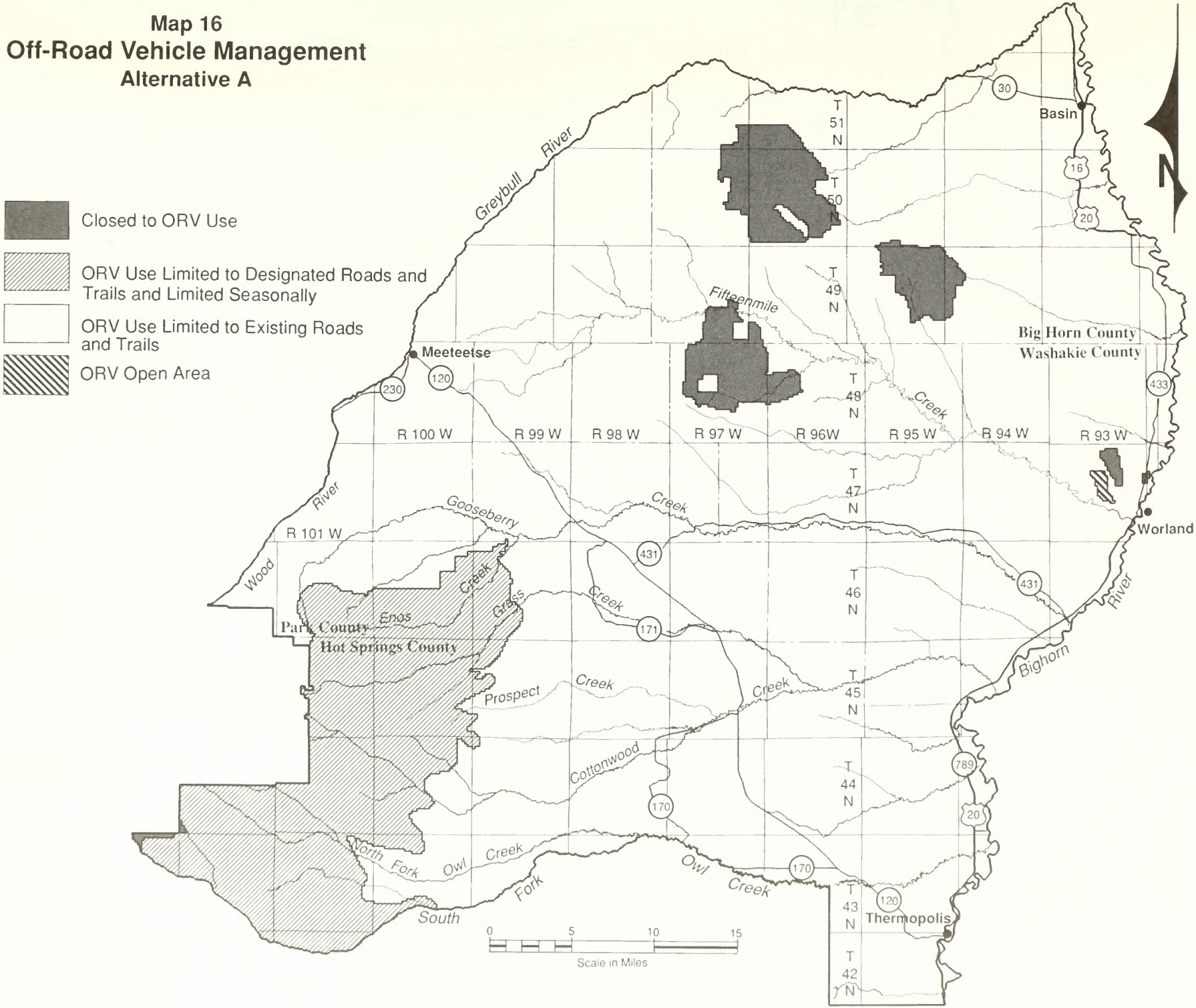
Map 14
Limits on Surface Disturbance
Alternative C



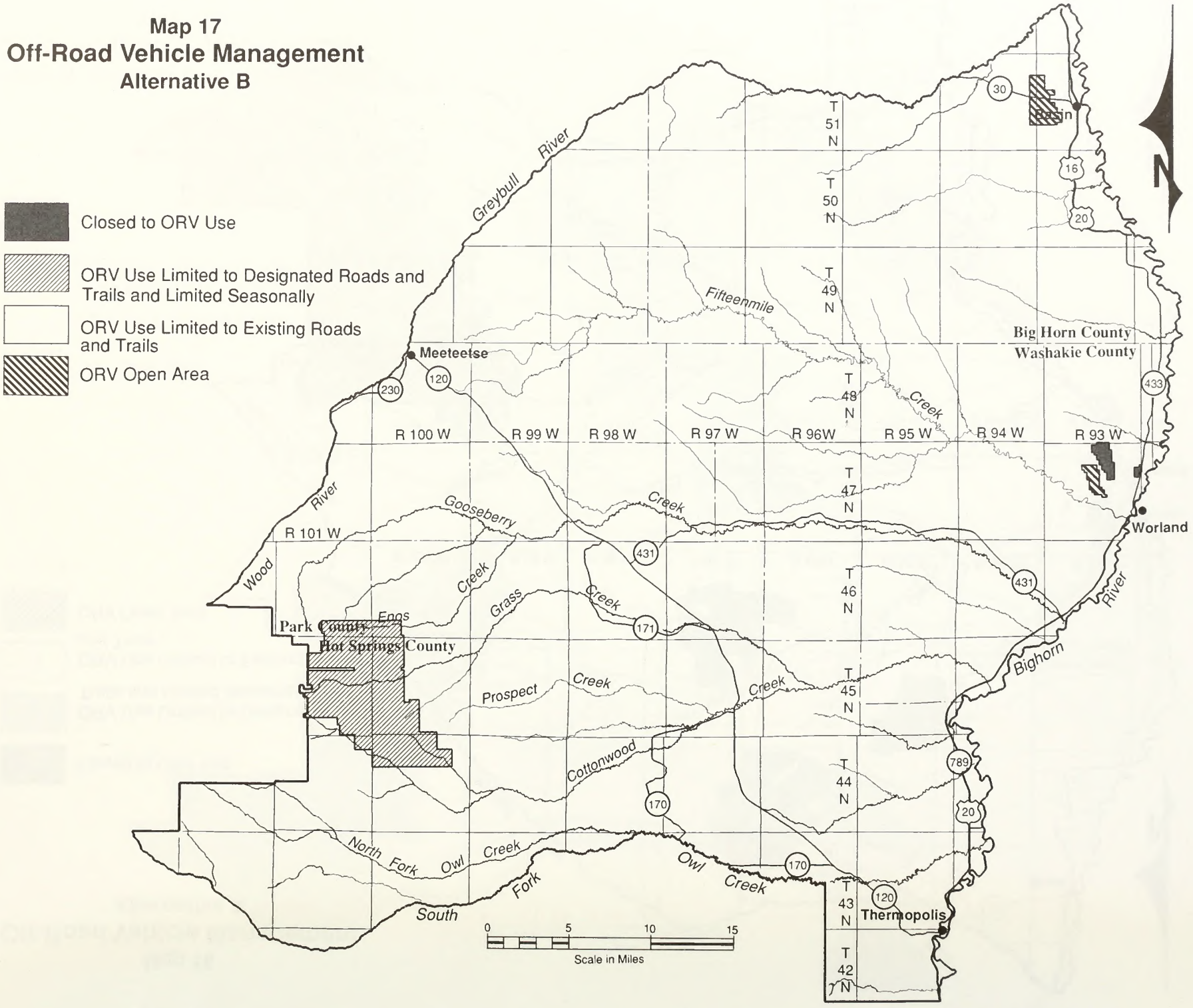
Map 15
Off-Road Vehicle Management
Preferred Alternative and Alternative C



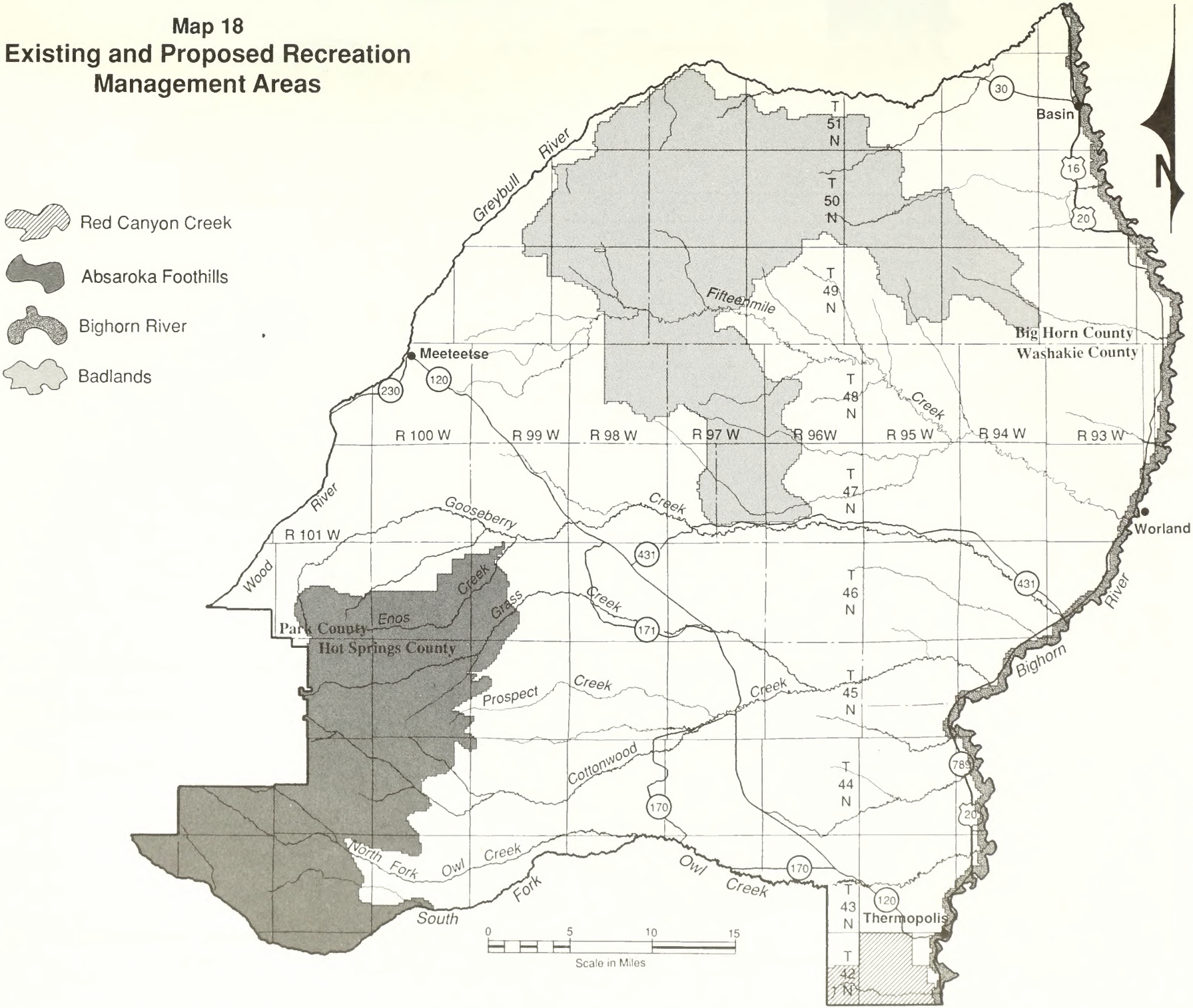
Map 16
Off-Road Vehicle Management
Alternative A



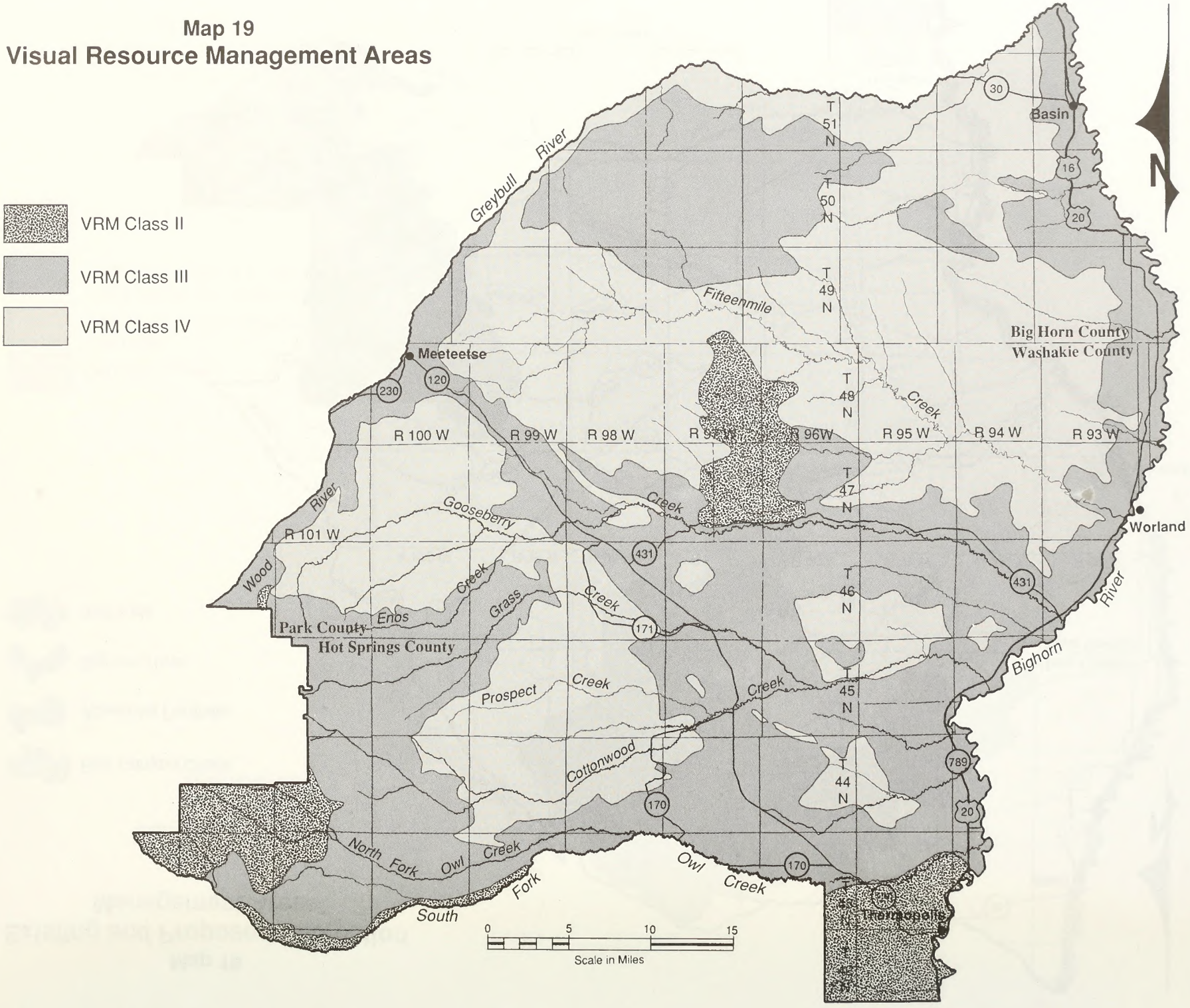
Map 17
Off-Road Vehicle Management
Alternative B



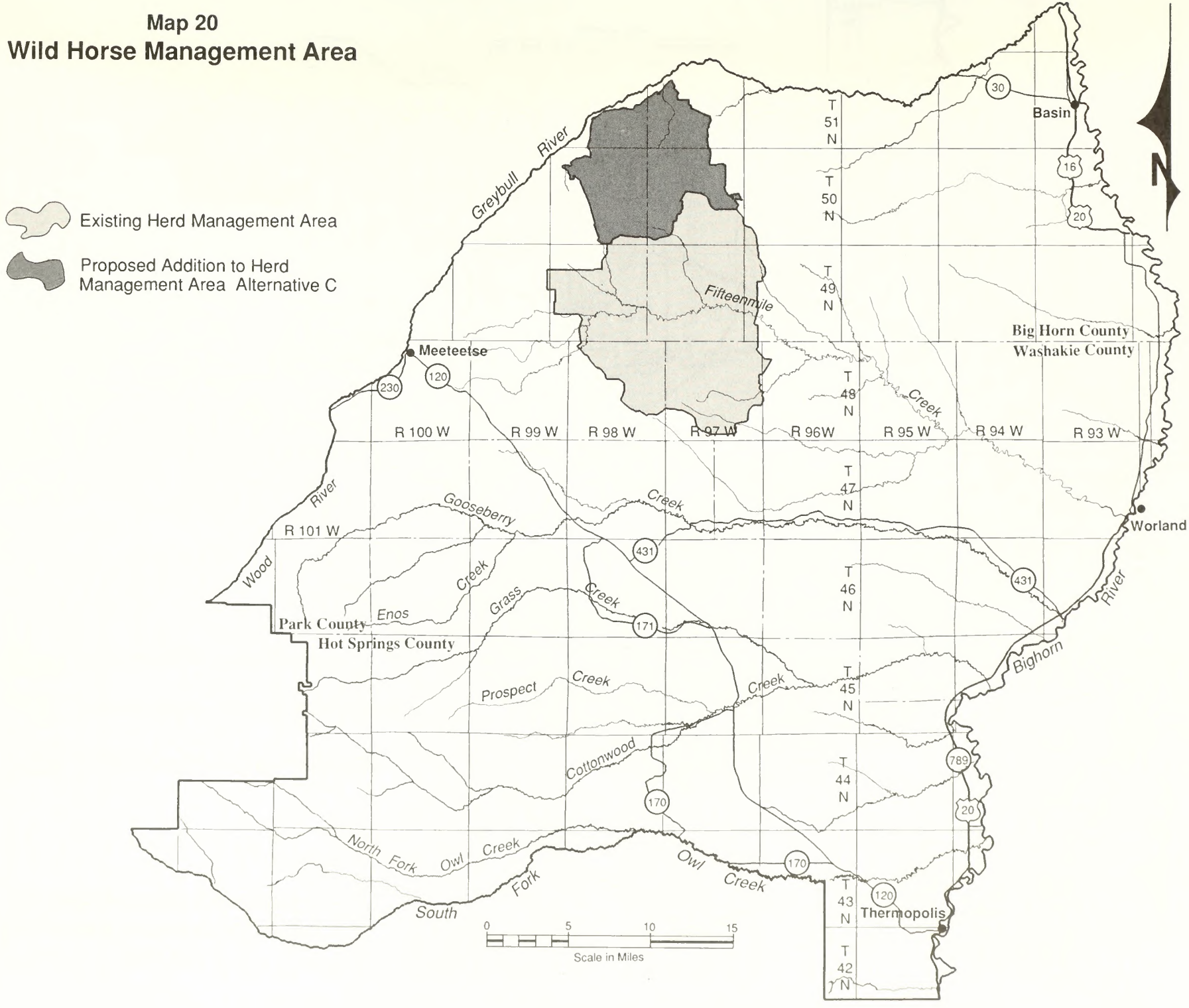
Map 18
Existing and Proposed Recreation Management Areas



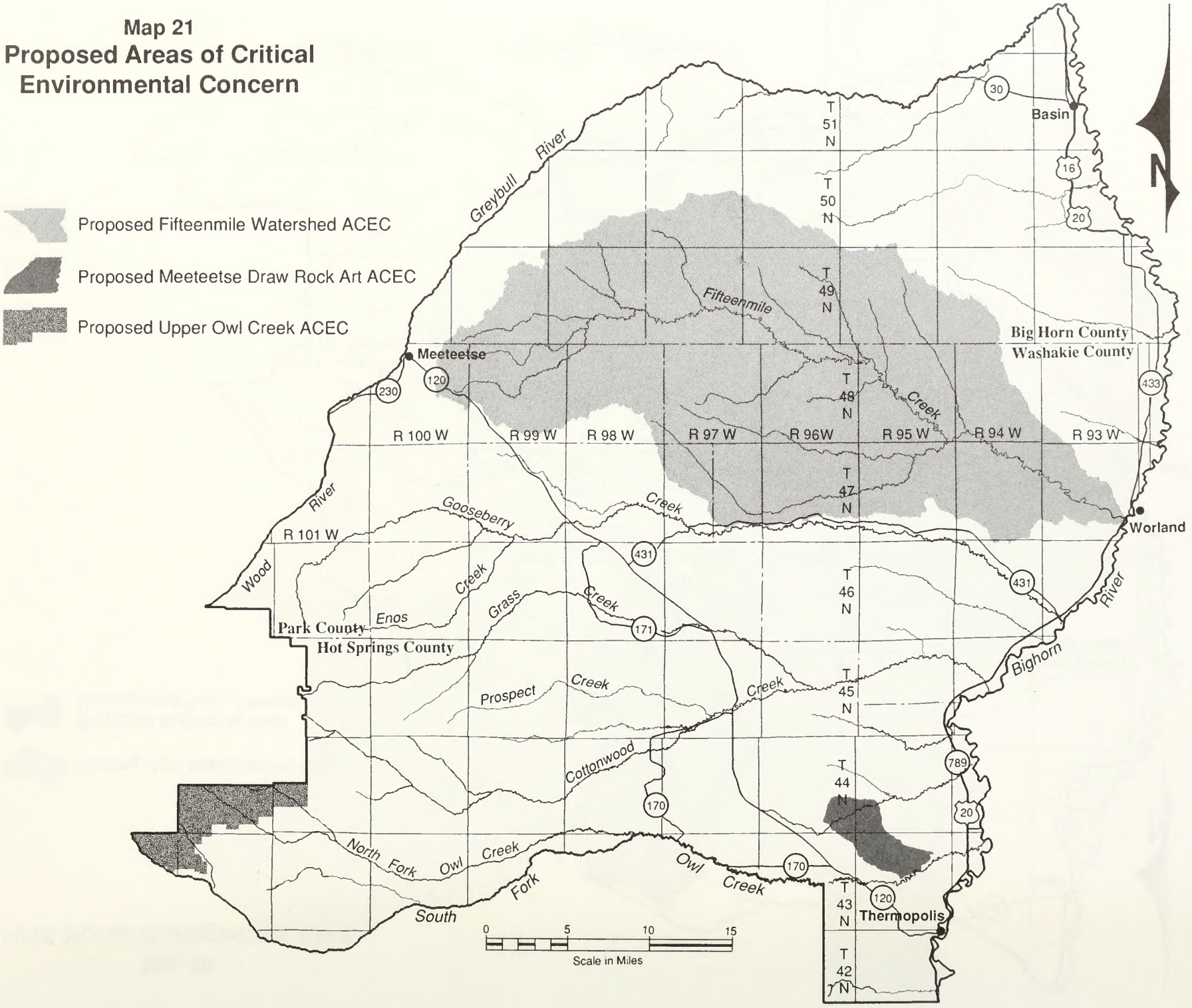
Map 19
Visual Resource Management Areas



Map 20
Wild Horse Management Area



Map 21
Proposed Areas of Critical Environmental Concern



CHAPTER 3

AFFECTED ENVIRONMENT

INTRODUCTION

This chapter contains a description of the existing physical, biological, and socioeconomic characteristics of the planning area that would be affected by the alternatives described in Chapter 2. Much of this information has been summarized from reports and other material on file in the Grass Creek Resource Area office. A list of information available upon request is provided in the "Planning Criteria and Planning Issues" section of Chapter 1.

AFFECTED RESOURCES

Air

Potentially Affected Airshed

BLM-authorized activities taking place in the planning area have the potential to affect air quality in the Bighorn Basin and the surrounding Absaroka, Owl Creek, and Bighorn mountains.

Climate

The eastern part of the planning area is a desert which grades westward into semiarid steppe. Further west, near the Absaroka Mountains, the steppe changes with elevation into mountain grassland, forest, subalpine, and alpine areas.

The frost-free season is longest on the eastern side of the planning area, averaging 125 days between the last spring and the first autumn frost, and decreasing with elevation to the west. At the highest elevations, the frost-free season is 25 days or less (Martner 1986).

Winds are predominantly from the northwest and west. Total annual precipitation is low, ranging from about 5 to 20 inches. (See Map 22.) Average daily temperatures range from about 15 degrees Fahrenheit in January to 74 degrees Fahrenheit in July.

Air Quality

Air quality and visibility in the planning area are generally good. The primary air pollutants include airborne dust, sulfur compounds associated with gas and oil exploration and development, and smoke and particles from fires.

The Absaroka and Washakie Wilderness Areas are Class I airsheds west of the planning area. Airshed classes are defined in the 1990 Clean Air Act. Pollutants produced in the planning area are generally carried away from these airsheds by prevailing westerly winds.

The Cloud Peak Wilderness is a Class I airshed at least 40 miles east of the planning area in the direction of the prevailing winds.

The entire planning area is classified as a Class II airshed. This designation allows for controlled growth with some degree of air quality degradation. There are no nonattainment areas where air quality standards aren't being met in the planning area.

Only one large air pollution point source is inside the planning area boundary: The Grass Creek Coal Mine is located on privately-owned land in Hot Springs County. Estimated emissions from the mine in 1990 were 26 tons of particulates. Other sources of air pollution near the planning area include the Highland Gas Sweetening Plant (east of Worland) and the Holly Sugar Beet Factory (at Worland).

These are classified by the Environmental Protection Agency as "major" sources (having the potential to emit 100 tons per year of a special criteria pollutant, or 250,000 tons per year total of any pollutant).

In gas and oil fields, air pollutants include airborne dust from construction activities and use of haul roads, hydrogen sulfide (H_2S) released from oil production equipment, and sulfur dioxide (SO_2) as an oxidation product of H_2S.

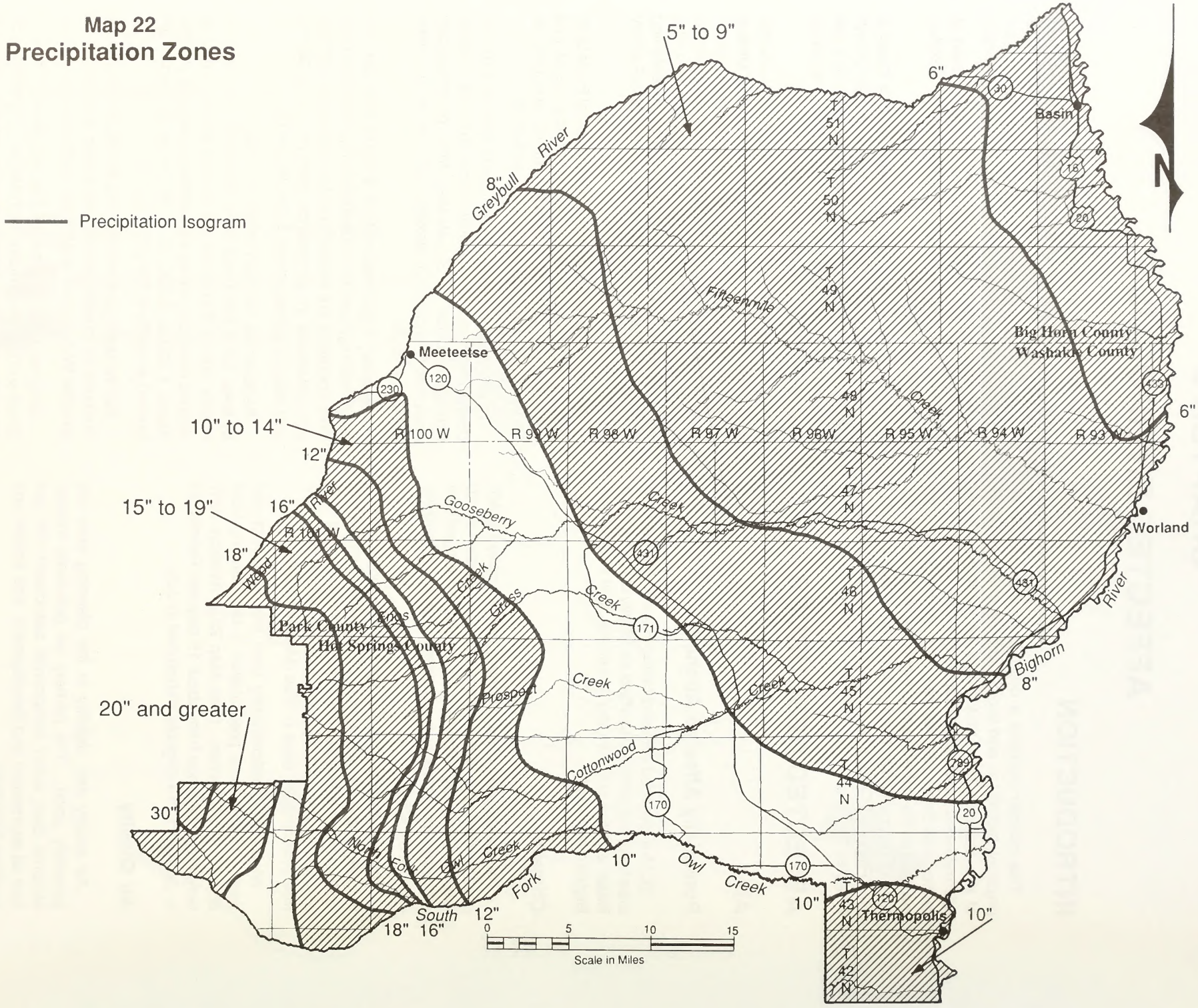
Relatively high levels of H_2S, a highly toxic gas, are associated with gas and oil fields in this part of Wyoming. Well operators are responsible for monitoring well-site concentrations in accordance with permit conditions and reporting these levels to the Wyoming DEQ.

Particulates, nitrogen oxides, and SO_2 are generated by fires. On public lands in the planning area, approximately 300 to 600 acres are burned annually by prescribed fire and 40 acres are burned annually by wildfire. About 1,000 to 2,000 acres of private farmlands are burned annually in the planning area.

Before setting prescribed fires, the BLM uses various methods to predict smoke dispersion and determine whether Wyoming air quality standards can be satisfied.

Minor sources of airborne dust include wind erosion of soil and the use of motorized vehicles on gravel roads. Natural geothermal activity releases small amounts of SO_2.

Map 22
Precipitation Zones



Increasing public concern over global climate warming warrants a discussion of greenhouse gas sources. The primary greenhouse gases are carbon dioxide (CO_2), methane, nitrous oxide (N_2O), chlorofluorocarbons, and ozone (Smith 1990). Activities that produce greenhouse gases in the planning area include coal, gas, and oil production (methane, nitrogen and sulfur compounds, and carbon monoxide), use of prescribed fire (carbon dioxide, carbon monoxide, and nitrogen oxides), and livestock grazing (methane).

Cultural, Paleontological, and Natural History Resources

Cultural Resources

Cultural resources in the planning area represent human occupation over many thousands of years. Cultural history in the planning area is generally believed to have begun with the arrival of the first humans at least 12,000 years before present (BP) and has continued since that time.

The planning area is in the Northwest Plains archaeological region, which is defined by environmental history, human adaptations, and the use of materials and food by humans. The cultural resource sites in the planning area represent three broad and overlapping cultural periods: the Prehistoric, the Protohistoric, and the Historic. The traditions, characteristics, highlights, and approximate dates of these cultural periods are shown in Tables 4 and 5.

TABLE 4
CULTURAL TRADITIONS AND CHRONOLOGY OF THE PREHISTORIC AND PROTOHISTORIC PERIODS

Cultural Period Time	Dates	Characteristics
Prehistoric		
Paleo-Indian	Prior to 7500 B.P.	Hunting and gathering before present associated with Pleistocene animals such as mammoth, camels, and *Bison antiques*; lanceolate spear points were used.
Early Archaic	8000 to 5000 B.P.	Arid climate called Altithermal; hunting and gathering associated with modern animals; large corner-notched and side-notched dart points were used.
Middle Archaic	5000 to 2500 B.P.	Sub-boreal climate similar to today's; there was greater emphasis on communal hunting and gathering; lanceolate, corner-notched, and side-notched dart points were used, as were a greater amount of ground stone tools and bone tools, compared to earlier periods.
Late Archaic	2500 to 1500 B.P.	Refinement of hunting and gathering continued; triangular corner-notched and side-notched dart points were used.
Late Prehistoric	1500 to 200 B.P.	Emphasis on communal hunting and gathering; technological innovations included the bow and arrow and pottery: These made hunting more efficient and enabled portable storage of foodstuffs.
Protohistoric	275 to 120 B.P.	Transition from Prehistoric to Historic Periods; life styles of Plains Indians were altered by the availability of horses; trade items of European or Asian origin such as beads were prevalent during this period.

TABLE 5
CULTURAL CHRONOLOGY OF THE HISTORIC PERIOD

Theme	Dates	Highlights
Fur Trade	1806 to 1840	John Colter entered the Bighorn Basin in 1806; two decades passed before active trapping began. In 1823 Jedidiah Smith traveled the "old Crow trail" into the Bighorn Basin on his way to the Wind River country. From 1823 to the 1840s, the area was trapped by fur trading companies. Jim Bridger visited the Bighorn Basin and later played a major role in its development. The era ends during the 1840s because the fur market collapses.
Exploration and Mining	1860 to 1879	Bridger Trail served as an important route to the Montana gold fields, avoiding hostile Sioux tribes along the Bozeman Trail. Most heavily used in 1864 when nine freight and wagon trains rolled over the Bridger trail. Limited hardrock prospecting activity occurred around 1870 and ended by 1879 because no major discoveries were made in the planning area.
Transportation and Agriculture	1871 to Present	John D. Woodruff became the first cattle rancher to settle in the region when he built a cabin on Owl Creek in 1871. He also became the first sheepman when he trailed a flock of 6,000 sheep into the Bighorn Basin in 1873. In 1884 the Rawlins to Fort Washakie Stage Road was extended to Meeteetse providing a stage and freight route between Meeteetse and Lander from 1884 to 1898. The first irrigation diversion ditch was built in the 1880s and the Big Horn Canal was built in 1905.
Energy Exploration Development	1890 to Present	Exploration and development of coal began in the and1890s. The first coal district was established north of Thermopolis in 1898 and coal development began in 1906. In 1914 a discovery well was drilled for the Grass Creek Oil and Gas Field 35 miles west of Thermopolis. Nine other fields were developed between 1914 and 1940. The gas and oil and coal industries have played major roles in the "Boom and Bust" cycles of the area.

About 1,300 cultural resources sites associated with the three overlapping cultural periods have been formally identified and evaluated in the planning area.

Prehistoric Period Sites

Campsites and Associated Lithic Scatters. These sites include hearth features and fire-cracked rocks with scattered lithic debris and stone tools. The hearth features indicate that these sites probably functioned as occupation, and plant and animal processing areas. Other activities may be inferred for individual campsites, depending on the features and artifacts present.

Quarry/Lithic Procurement. This category includes two types of sites. The first are quarries where lithic (stone) materials were excavated for making stone tools. The second are procurement sites where surface materials were collected. Procurement sites are more common than quarries in the planning area. At these sites, materials were tested to determine if stone tools could be produced. Artifacts such as waste flakes are common at these sites, but finished stone tools are rare.

Rock Features. These sites are often stone circles which may have been associated with tipis. The stones may have secured the edges of the tipis against the wind and rain. It is not known how other features, such as stone cairns or monuments, functioned. In some cases, a series of cairns arranged in a line may be the remains of trail markers. Single cairns may have marked caches, burials, or other important locations. Many of these cairns may have had historical uses, such as marking mining claims, fence lines, or survey locations. Another type of rock feature is the vision quest. These are usually stone arcs or walls in isolated and rugged terrain used by Native Americans for sacred purposes. Effigy figures include large figures made from stones laid on the ground. The figures often depict animals or human-like beings. The function of these figures is uncertain, however, they may have been used for sacred purposes by Native Americans.

Petroglyph/Pictograph. These sites are defined by the presence of prehistoric rock art which has been inscribed into (petroglyph) or painted onto (pictograph) stone surfaces. Many of these sites are found in the planning area on sandstones in the Cloverly and Frontier formations (see figure 1, Geologic Column, in the Minerals section). Current research indicates that the planning area may have one of the largest collections of petroglyph/pictograph sites in the Northwestern Plains.

Multiple-Activity Areas and Other Sites. These have similarities to campsites and quarry/lithic procurement sites. Important historic and prehistoric information can be gained on a variety of activities. Other sites are characterized by bone beds and bone scatters. These sites are rare and poorly understood.

Protohistoric Period Sites

Protohistoric Period sites are characterized by European or Asian trade items such as beads and other glassware, metal projectile points, metal bangles, and equestrian equipment. Associated artifacts include stone tools and pottery.

Historic Period Sites

The Historic Period is represented by the following general themes.

Farming-Ranching. The sites associated with this theme are generally ranching-related or irrigation and farming-related. These include ranch buildings, irrigation ditches, trash scatters, inscriptions, and stock herding camps and trails.

Transportation. These include trails or stage routes and bridges with associated trash scatters or inscriptions. Sites include the Bridger Trail and the Fort Washakie-to-Red Lodge stage route.

Industrial. Sites include early oil fields and coal mines with their associated mine openings, mineral production equipment, trash scatters, and inscriptions.

Prehistoric sites represent about 85 percent of the total sites inventoried in the planning area. The majority of these are campsites and associated lithic scatters. Protohistoric represent about 1 percent and Historic sites about 14 percent. About three in ten sites are eligible for listing on the National Register of Historic Places.

Native American Traditional Cultural Values

During historic times the planning area was occupied by the Northern Arapaho, the Crow, and the Shoshone. These tribes share the belief that sacred or spiritual aspects of the environment, sites, localities, human-made features, animals, and plants should be treated with respect. Studies in the planning area have identified nine kinds of sites which are likely to have sacred attributes or traditional cultural values to Native Americans. These are: (1) rock art; (2) stone circles; (3) effigy figures, medicine wheels, very large cairns, and monumental human-like rock structures; (4) burials; (5) Sun Dance lodges; (6) vision quest structures; (7) historic battle sites; (8) trails to the Bighorn Medicine Wheel; and (9) sweat lodges. Many of these sites occur in the planning area and some are still used for ceremonies.

Paleontology

The planning area is an important paleontological area containing geologic formations with fossils from the Jurassic and Cretaceous periods (180 to 65 million years BP) and the Paleocene and Eocene epochs of the Tertiary Period (65 to 40 million years BP). These fossils include a hadrosaur recently discovered near Meeteetse, Wyoming, and a vast array of mammalian fossils. Included are some of the earliest known bats and rodents in North America. These deposits are also known for their abundance of fossil plants. The Bighorn Basin is one of the few places in the world where the fossil record, as shown in the rocks, is uninterrupted from the demise of dinosaurs through the early diversification of mammals.

Natural History

National natural landmarks are areas having nationally significant ecological or geological features. The National Park Service (NPS) studies potential landmarks and makes recommendations to the Secretary of the Interior regarding designation. In the late 1970s, three areas were proposed for further study as National Natural Landmarks: Gooseberry Badlands, East Ridge-Fifteenmile Creek Badlands, and Tatman Mountain.

Gooseberry Badlands

The Gooseberry Badlands comprise about 30,000 acres of rugged terrain. The BLM administers all public land within the proposed landmark. Preliminary studies of the Gooseberry Badlands characterize it as an area of badlands topography rich in both natural and cultural resources. This rugged and colorful landscape is dominated by a variety of rock hoodoos, arches, castles, and mushrooms. Visual intrusions are rare.

East Ridge-Fifteenmile Creek Badlands

The East Ridge-Fifteenmile Creek Badlands encompass about 69,100 acres, although the boundaries of the

area are not firmly established. The BLM administers all of the public land in the proposed landmark.

The badlands around East Ridge and associated ridges along the upper portions of Fifteenmile, Crooked, and Timber creeks are some of the most spectacular in the central Rocky Mountains. The Eocene Willwood Formation is exposed in these intricately carved and colorful exposures. It was from these beds that the fossil horse, Eohippus (*Hyracotherium*), was collected along with skeletons of many other early fossil mammals. This badland area is extensively fossiliferous.

Tatman Mountain

The Tatman Mountain area encompasses about 9,600 acres, the majority being public land, although the NPS has not firmly established the boundaries of the area. Tatman Mountain is a gravel-capped mesa where the Greybull River once flowed. This area includes Tertiary age rocks of the Eocene Tatman and Willwood formations. An excellent record of Rocky Mountain geologic history is preserved along the margins of Tatman Mountain.

Fire

Fire History

In precipitation areas greater than 10 inches annually, the natural fire interval on south-facing slopes varies from 10 to 50 years and from 80 to 200 years on north-facing slopes. Fire frequency is very low in the 5- to 9-inch precipitation zone.

Information on wildfires in the planning area, for the 10-year period January 1982 through December 1991, is summarized in the Grass Creek Resource Area planning files. During this period, a total of 26 wildfires have burned 459 acres. Individual fire size ranged from 0.1 to 100 acres, with an average of 18 acres. Thirty-eight percent of all fires were 5 acres or less and 19 percent of all fires were 1 acre or less. Fires in the planning area average three per year. Seventeen fires (65 percent) were of human or unknown origin and nine fires (35 percent) were caused by lightning. Many of the human-caused fires were related to some type of land-use activity such as ditch or debris burning.

General Fire Effects

Fire is an important component for change in many forest and range ecosystems. Fire restores a balance by regulating the accumulation of organic matter and recycles carbon and other important nutrients.

Burning during the growing season is usually more damaging than burning during the dormant period when root reserves are high and live tissues are less vulnerable to damage. The season may also directly affect fire intensity.

Fire intensity is very important in shrubs and trees where crown scorch and bud damage may prevent survival even if the root system has survived the fire. This is critical in plants that don't sprout from the roots following fire, such as sagebrush. While many plants are adapted to an occasional fire, repeated fires at certain times of the year will damage fire-sensitive plants, such as Idaho fescue.

Soil moisture is a critical factor for vegetation recovery. Sufficient soil moisture protects both plants and their roots, thereby enhancing recovery. In general, grasses recover in 1 to 5 years. Sagebrush and other nonsprouting shrubs recover in 10 to 30 years, other shrubs recover sooner.

Fire plays a major role in determining the vegetative makeup of the Bighorn Basin even though wildfire is infrequent. Generally, fires promote grasses at the expense of trees and shrubs.

Fire suppression has limited the spread of both natural and human-caused fires. Grazing of fine fuels has limited the ignition and spread of wildfires. These two factors have the greatest potential to change the vegetative communities of the Bighorn Basin.

The young, tender growth after fire has high nutrient content, is more palatable, and easily accessible to livestock and wildlife. Forbs that provide an important food source for many upland game birds usually are more abundant on burned areas. Shrub resprouts are more nutritious up to three years after a burn.

Fire Effects on Vegetation Communities

Salt Bottom Community

Shrubs in this community are primarily sagebrush, greasewood, and rabbitbrush. These shrubs sometimes form canopies that can spread small wildfires along waterways. Fire in this plant community kills sagebrush and enhances greasewood and rabbitbrush; therefore, fires can decrease shrub diversity by one-third. Adjacent cottonwoods can also be killed along waterways and, for these reasons, prescribed fire is not used in salt bottom communities.

Basin Grassland/Shrub Community

This plant community is identified on Map A (in pocket) as high- and low-density sagebrush. Only the

high-density sagebrush areas contain enough fuel to allow fires to spread. High-density sagebrush occurs in pockets which provide important habitat for deer, antelope, and sage grouse. Because these pockets contribute to vegetative diversity in relation to surrounding areas, fires should be avoided. Fire in this plant community generally reduces biological diversity.

Foothills-Mountain Grassland/Shrub Community

Wild and prescribed fires are important for the management of this plant community. Fuels are often sufficient to spread fire over large areas, sometimes damaging wildlife habitat and spreading to commercial forestlands, or destroying private property. For these reasons, fires are often suppressed in this plant community. But in some cases, fire fighting and grazing of fine fuels can result in a heavy canopy of sagebrush with a limited understory. Limber pine and juniper also invade. Prescribed fires are used in this community to increase plant diversity and produce more forage.

Riparian Communities

Riparian communities are generally too wet to burn except during times of drought. Fire can damage young cottonwoods, however, the bark of older cottonwoods can insulate the tree against low intensity fire. By eliminating desirable woody plants, such as young cottonwoods and willows, fire reduces the diversity of riparian vegetation. Undesirable plants, like salt cedar and russian olive, sprout after a fire and become dominant. Consequently prescribed fire is seldom used in riparian areas.

Woodland Communities

Limber pine and juniper woodland communities tend to occupy areas with shallow soils. The trees are often widely spaced and understories are sparse, reducing the potential for fire to spread. Only in extreme conditions of dry fuels and high winds can crown fires burn significant acreage. Prescribed fires are usually not attempted in this plant community. The woodland canopy on these shallow soils is generally considered valuable as wildlife cover.

In the absence of fire, limber pine and juniper will invade areas of deeper soils adjacent to the shallow sites described above. However, the understory vegetation on deeper soils will carry fire and the woodland canopy is periodically removed. In this way, some areas periodically change from foothills-mountain/grassland shrub to woodland, and back again, depending on the interval since the last fire. Fire can be used to promote diversity and forage production in these areas. If woodland canopy is common in the area, then prescribed fire is used to enhance forage production. Conversely, if woodland cover is rare, these sites provide wildlife cover.

Mixed Conifer/Deciduous Community

The mixed conifer/deciduous community includes conifers and aspen together. Without fire or other disturbances, most aspen stands decline. Fires tend to enhance aspen but they can damage valuable resources on adjacent lands including commercial timber, wildlife habitat, and scenic qualities. This can limit the amount of acres burned to enhance aspen.

Forest communities are obviously susceptible to wildfire. Engelmann spruce and subalpine fir are easily killed. Douglas-fir is relatively tolerant because the bark of mature trees can insulate against low intensity ground fires. Although lodgepole pines may be killed, fires are beneficial in regenerating the trees by opening the pine cones. In this community, prescribed fire is used primarily to reduce slash from logging.

Other Vegetation Communities

Salt Desert Shrub Communities and Barren and Alpine areas rarely contain enough fuel to spread fires.

Lands And Realty

Access

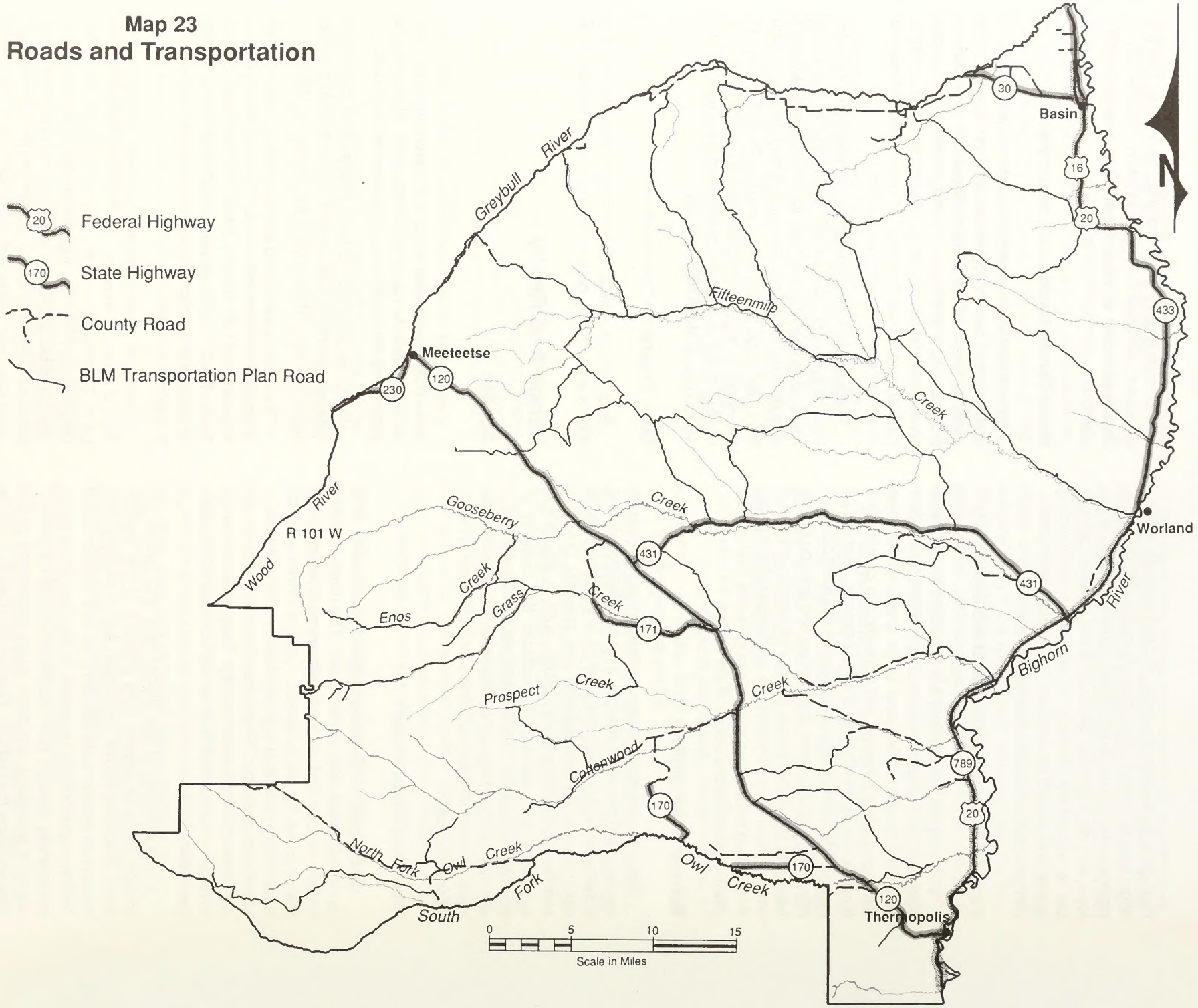
Legal public access is available on county roads and some BLM-maintained roads in the planning area. Access to public lands is acquired when BLM secures easements on roads crossing private or state land.

BLM has not acquired legal access on a majority of the roads currently listed on the Worland District Transportation Plan. These roads are shown on Map 23.

The BLM has acquired exclusive easements for public use on the Fifteenmile, Platte Pipeline, Dorsey Creek, Whistleberry Hill, Murphy Draw, Fenton Pass, Squaw Teats, South Owl Creek, and Dutch Nick roads. A total of 23 exclusive road easements have been acquired in the planning area.

Cooperative management has been established by the LU Sheep Company, the Wyoming State Board of Land Commissioners, the Wyoming Game and Fish Department (WGFD), and the Worland District BLM to provide public access on roads south and north of Grass and Enos creeks. A similar agreement for road management has been made with the WGFD and landowners along the upper South Fork of Owl Creek. The WGFD

Map 23
Roads and Transportation



has acquired several public fishing and boating access easements along the Bighorn River. Map 24 shows public lands in the planning area that lack legal public access.

Landownership

Map B in the pocket at the back of this document depicts the landownership patterns in the planning area. Generally, public lands are fairly well consolidated with the exception of the southwestern part of the planning area where BLM, state, and private lands are intermixed.

Rights-of-Way

Restrictions on surface-disturbing activities can have an effect on the costs and locations of rights-of-way that are developed in the planning area. The following rights-of-way have been proposed for construction within the next five years.

1. In 1994 Western Area Power completed an upgrade of the transmission line between Thermopolis and the Carter Mountain substation near the junction of the Little Buffalo Basin oil field road and Wyoming 120. A similar upgrade has been proposed between Carter Mountain and Big George substation. The line will follow the existing right-of-way.
2. The Altamont natural gas pipeline from Canada to Opal, Wyoming is projected to cross about 20 miles of the planning area. The pipeline will follow an existing pipeline route.
3. The Wyoming Transportation Department will be reconstructing the Buffalo Creek and Meeteetse south sections of Wyoming 120 to improve about 13 miles. The upgrading will generally follow the existing alignment with some minor changes. The right-of-way width will be 200 feet on either side of centerline with a few exceptions where topography or existing facilities restrict the width to 100 feet.

Livestock Grazing

Active preference (see Glossary) on public lands is 101,451 animal unit months (AUMs). Allotments can contain (in addition to public lands) state, private, and other federal agency land. The total authorized grazing (see Glossary) use on BLM grazing permits would include use on all lands within an allotment where the lands are managed-in-common. The total authorized use is based on the percentage of public land forage as established in the grazing permit. In the planning area, 157,375 AUMs were authorized on all lands within the grazing allotments during 1990. Compared to this level, the actual grazing use was 130,926 AUMs. This level of grazing within allotments included 75,178 AUMs on public lands, 12,647 AUMs on state-owned lands, 759 AUMs on BOR-administered federal lands, and 42,342 AUMs on privately-owned lands. Other livestock grazing occurs within the planning area boundary on state and privately-owned lands that are not within BLM-administered grazing allotments. Most of this use occurs during the winter on irrigated farmlands. In 1990, an estimated 36,900 AUMs were grazed on these lands. Based on these grazing levels, public lands supplied about 45 percent of the demand for grazing in 1990.

In 1990, the livestock grazed on public lands were 24,857 sheep, 81,933 cattle, and 687 horses. A total of 102 operators grazed livestock on public lands and $141,243 were paid to the BLM in grazing fees (based on the 1990 grazing fee of $1.86 per AUM).

The condition of vegetation, season of use, kind of livestock, terrain, and availability of water affect livestock grazing. These factors identify where lands are "suitable" for grazing without causing damage to the soil and vegetation. Without considering the suitability, the rangeland vegetation inventory (see Appendix 1) for the planning area indicates that about 131,000 AUMs of forage were available for livestock in 1990. Of that amount, about 113,510 AUMs were suitable for grazing on all lands within allotment boundaries.

These suitability adjustments were calculated for "I" (improve) category allotments where cattle are grazed during the summer. This is the most common season of use on BLM-administered grazing allotments. Cattle move greater distances in cool weather, while sheep are herded for this purpose, resulting in more efficient use of an allotment's vegetation. Therefore, available forage was not calculated for suitability in sheep allotments or where cattle graze in the winter, early spring, or late fall. Adjustments for suitability also were not calculated in "M" (maintain) and "C" (custodial) category allotments where livestock distribution usually is not a concern.

The "Vegetation" section of this chapter describes vegetative condition in the planning area. Appendix 3 describes forage suitability by allotment and other information on livestock grazing. Also see Map B in the map pocket for grazing allotment boundaries.

Minerals

Figure 1 lists the geologic formations in the planning area along with their ages, lithologies, and important mineral and fossil resources.

Map 24
Lands Lacking Legal Public Access

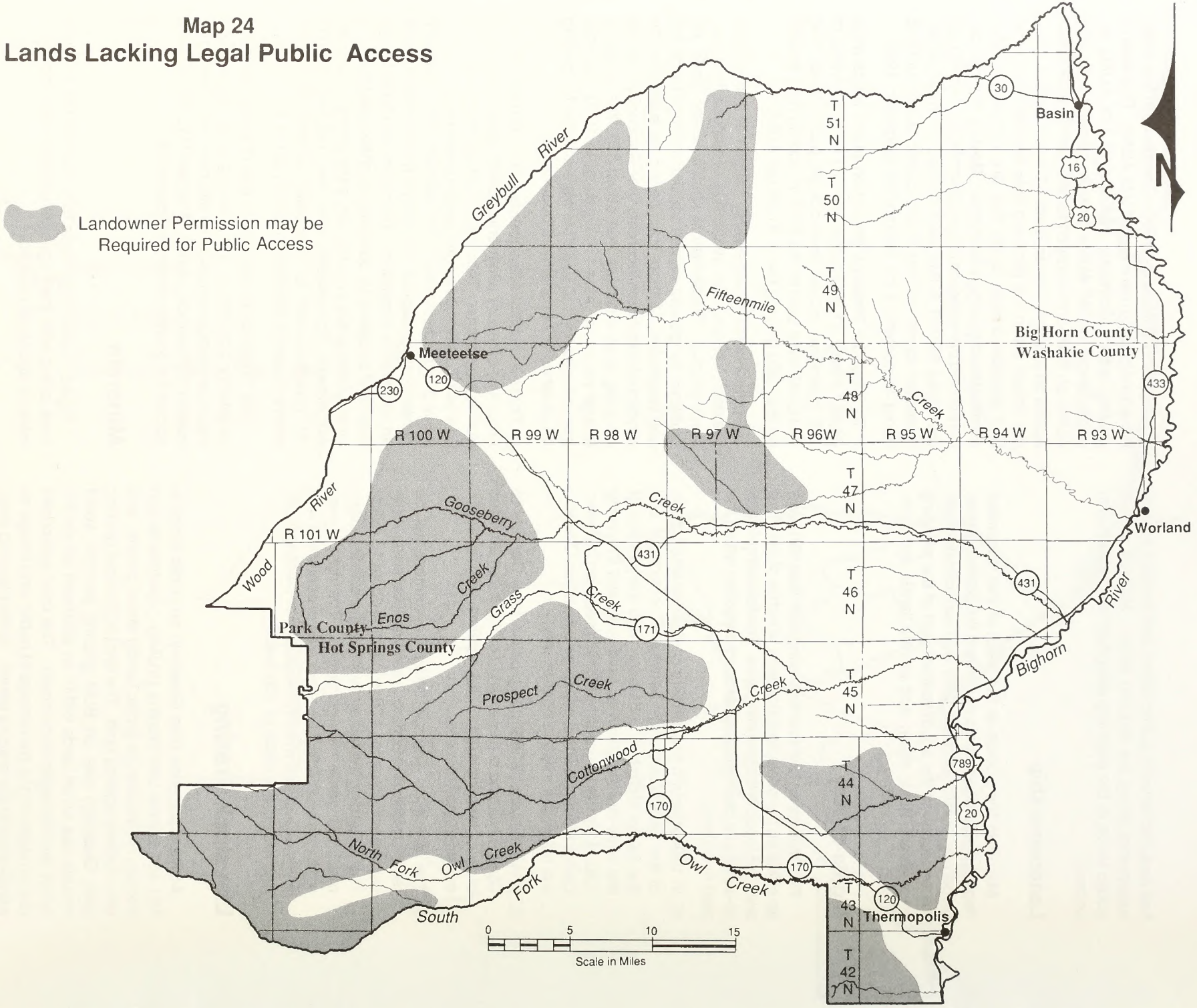
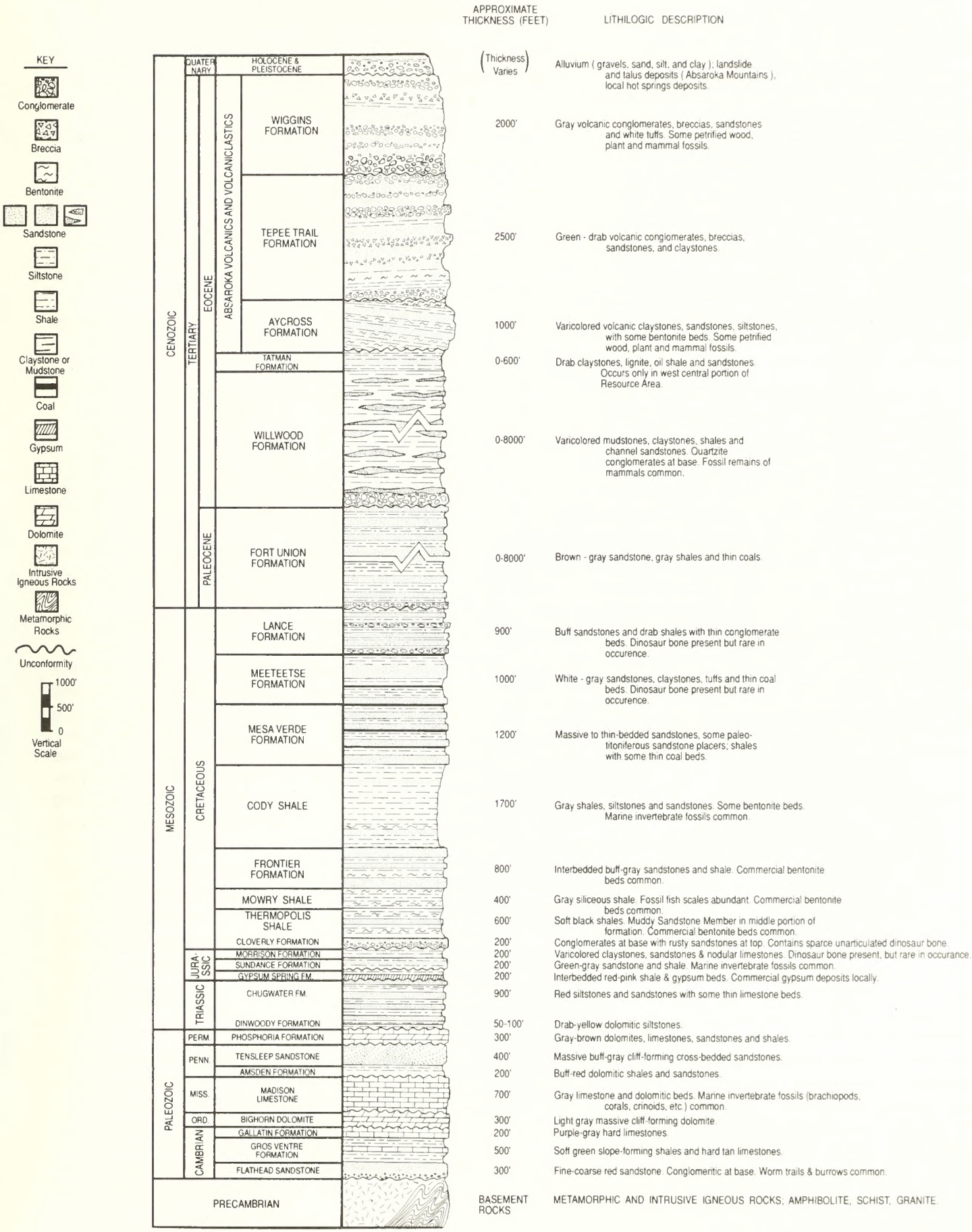


Figure 1
Geologic Column



Coal

In the planning area, coal has been mined in the Grass Creek, Gebo, and Meeteetse coal fields. Coal seams of varying thickness occur in the Cretaceous age Mesaverde and Meeteetse formations, and in the Paleocene age Fort Union Formation. These coals are interbedded with shales, sandstones, and siltstones. In some areas the coal has burned naturally and baked the overlying rock to form clinker (scoria). The only coal field currently being mined is the Grass Creek field. Coal mined from the Grass Creek coal field has an average sulfur content of 0.4 percent, and average ash content of 7.4 percent, and an average heating value of 10,970 British Thermal Units per pound (Glass, 1978). Western Energy, Inc. produces 70,000 to 100,000 tons of coal per year from their strip mine located on private land.

No coal is currently mined or leased on BLM-administered public lands in the planning area. The most recent federal coal leases were relinquished in 1986. Several coal exploration licenses were issued but these all expired in the mid-1980s. A known coal leasing area was established in 1977 in the Grass Creek coal field on 320 acres of BLM-administered mineral estate and 1,200 acres of private and state land.

Local interest has been expressed by Spring Creek Coal Company in developing BLM-administered coal in the Grass Creek field. The coal in this field is produced from the Fort Union Formation and is classified as subbituminous. It is anticipated that up to 40 acres of BLM-administered coal would be developed during the analysis period, with 5 to 10 acres disturbed annually. Anticipated coal production from BLM-administered lands would be about 50,000 tons annually beginning in 1998.

Gas and Oil

In 1990 there were 26 active gas and oil fields that produced about 6.7 billion cubic feet of gas and 7.4 million barrels of oil from the BLM-administered mineral estate. (See Appendix 4.) The Hamilton Dome, Little Buffalo Basin, and Grass Creek fields rank ninth, tenth, and eleventh in oil production in the state of Wyoming. The most important producing formations are the Frontier, Phosphoria, Tensleep Sandstone, and Madison Limestone. Other production comes from the Muddy Sandstone Member of the Thermopolis Shale, Amsden, Bighorn Dolomite, Cloverly, Chugwater, Dinwoody, and Mesaverde formations. Map 25 shows gas and oil fields and resource potential. Map 26 shows gas and oil prospects (or geologic "plays") identified by the U.S. Geological Survey (Fox and Dolton, 1989).

Locatable Minerals

Bentonite, gypsum, sulfur, and titanium are the principal locatable minerals found in the planning area. Map 27 shows where these minerals are known to occur.

Most of the locatable minerals occur in the southeastern portion of the planning area. Bentonite crops out along the flanks of the Thermopolis Anticline. Bentonite is also found at Hamilton Dome and in scattered occurrences near Soapy Dale Peak and south of Putney Flat. Bentonite-bearing formations include the Cretaceous age Frontier Formation and the Mowry and Thermopolis shales.

Sulfur is found in alluvial gravels and travertine deposits associated with extinct hot springs on both flanks of the Thermopolis Anticline. Pockets of sulfur are also found in the Permian age Phosphoria Formation and the Triassic age Chugwater Formation.

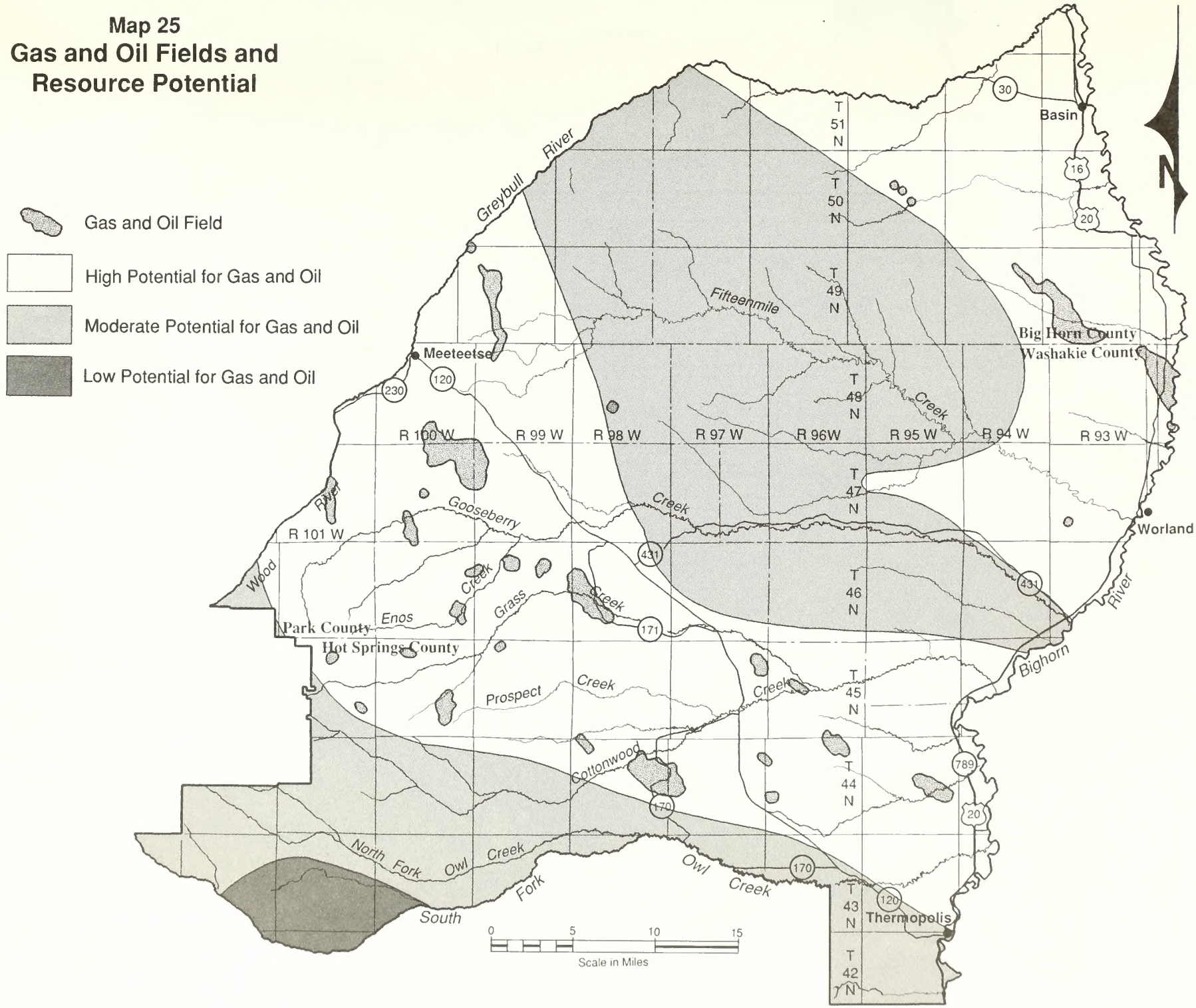
Gypsum is generally confined to the Gypsum Spring and Chugwater formations, which crop out around the Thermopolis Anticline. Beds of gypsum 30 to 40 feet thick have been reported. Gypsum is also associated with sulfur deposits found in the Phosphoria and Chugwater formations west of the town Thermopolis. Some gypsum-bearing rocks are also located northeast of Anchor Reservoir.

Titanium-bearing black sandstones are present in the Cretaceous age Mesaverde Formation. This formation is conspicuous in forming "rimrock" which circles the Grass Creek Anticline. Titanium-bearing sandstones crop out on opposite flanks of the anticline. The titanium occurs as an oxide in association with other heavy minerals such as zircon, monazite, and iron. The Grass Creek deposit is the largest high grade deposit in Wyoming. A less prominent outcrop of titanium-bearing sandstone, the Cottonwood Creek deposit, is 10 miles to the southeast.

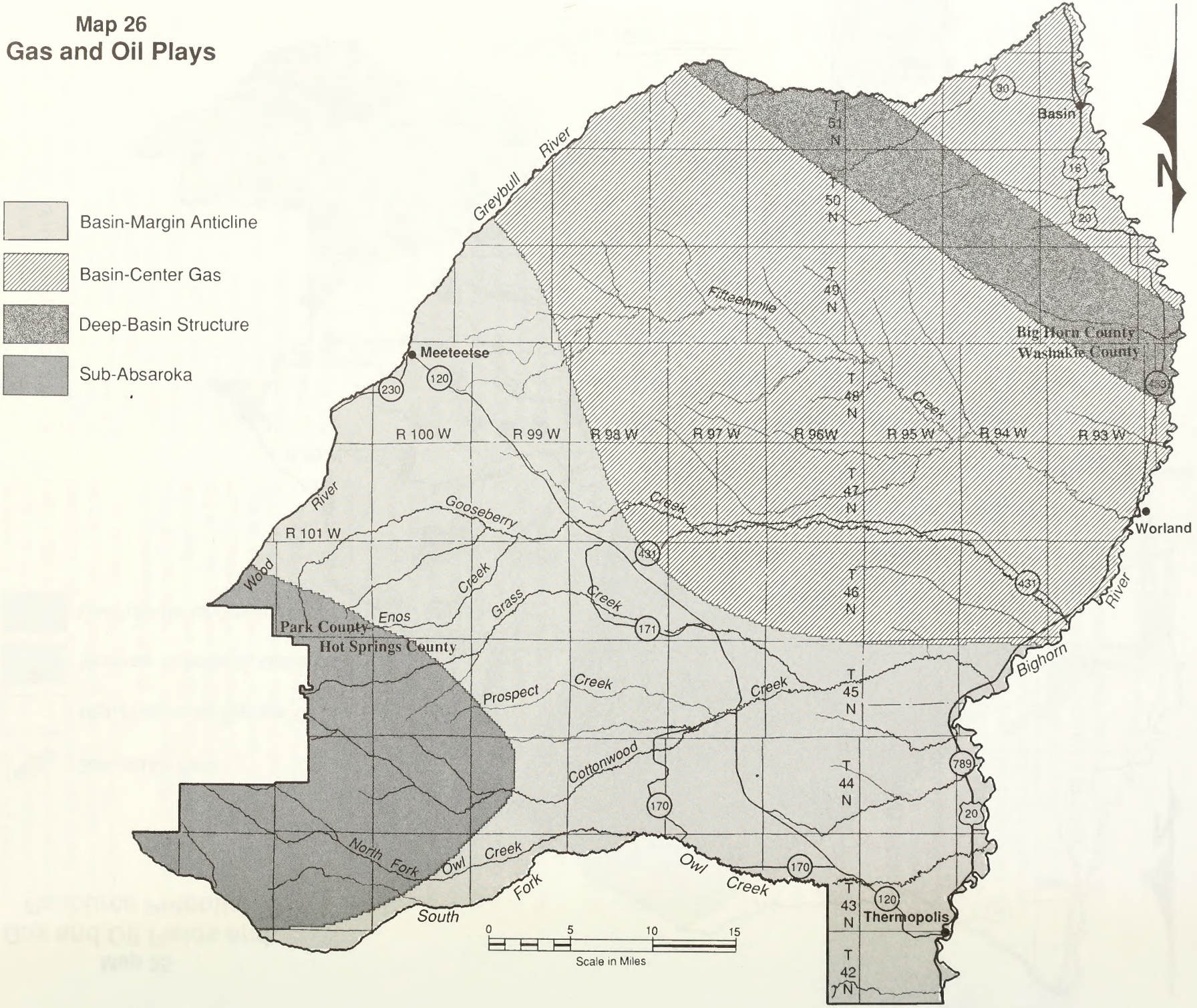
Recent exploration in the area between the North and South forks of Owl Creek has indicated the presence in very small quantities of gold, silver, platinum, and rare earth minerals. The rocks being explored on the eastern slopes of the Absaroka Mountains are volcanic. To date, exploration has been confined to private lands but may include public lands in the future because mining claims have been recently staked.

As of 1990, fewer than 300 mining claims had been staked in the planning area and no locatable minerals were being mined. Most surface-disturbing activity has been limited to exploration and other claim assessment work such as road construction and maintenance. One bentonite pit on about 40 acres is open, but production has been suspended. It is anticipated that bentonite

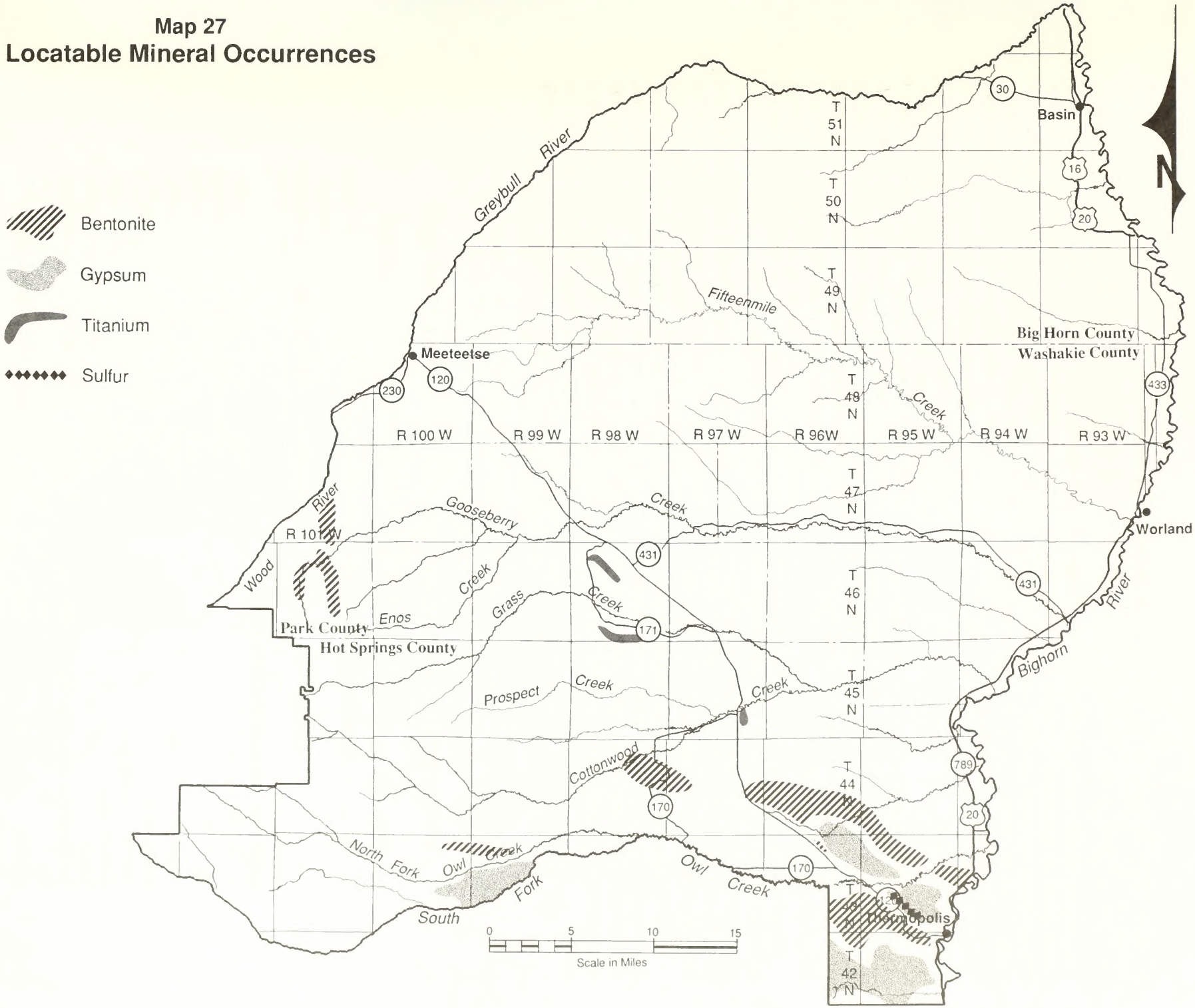
Map 25
Gas and Oil Fields and Resource Potential



Map 26
Gas and Oil Plays



Map 27
Locatable Mineral Occurrences



would be mined from one or two pits on public land starting in 1996. Annual production would average 100,000 tons.

During the analysis period, about 300 acres of disturbance would be caused by bentonite exploration and mining. About 300 acres would be disturbed by exploration activity on mining claims located for gypsum, sulphur, and titanium-bearing sandstone.

Salable Minerals

In the planning area the salable minerals are sand and gravel, flagstone, moss rock, and clinker (baked clay). These were mined from 25 pits during 1990. The most important are sand and gravel, usually found in terraces along major streams.

Flagstone and moss rock occur where hard limestones and sandstones crop out. High grade flagstone and moss rock occur in the Phosphoria, Sundance, Cloverly, and Mesaverde formations. Clinker occurs in the Mesaverde Formation associated with coal beds.

Table 15 (Assumptions for Analysis) in Chapter 4 contains additional information on estimated levels of mineral exploration and development. Mineral ownership in the planning area is shown on Map C in the map pocket.

Recreation

The types of recreation available on public lands in the planning area include camping, hiking, sightseeing, bicycling, crosscountry skiing, horseback riding, rock collecting, hunting, and fishing. Most of the recreational use is dispersed throughout the planning area or within large geographical areas like the Absaroka Mountain foothills, the badlands north of Gooseberry Creek, and the Bighorn River. Recreational use also occurs on public lands used for off-road vehicle driving and in historic coal mining areas such as the former towns of Gebo and Crosby. Another area with high potential for recreational use, but currently having limited access, is Red Canyon Creek south of Thermopolis. Opportunities include hiking, hunting, and photographing wildlife and scenery. In the Absaroka Mountain foothills, the Grass Creek Road provides the only direct vehicle access to the Shoshone National Forest.

Compared to state and privately-owned lands in the planning area, public lands provide about 40 percent of the elk hunting, 85 percent of the pronghorn antelope hunting, 55 percent of the deer hunting, 30 percent of the moose hunting, 65 percent of the sage grouse hunting, 90 percent of the camping, and 85 percent of the off-road driving. On public lands, about 72 percent of the recreational use is made by Wyoming residents. Activities showing the highest percentages of nonresident use are boating, sightseeing, and fishing. (See Tables 6 and 7.)

TABLE 6
ESTIMATED RECREATIONAL USE FOR CALENDAR YEAR 1990 ON ALL PLANNING AREA LANDS[1]

Activity	Resident	Nonresident	Visitor Use Days
NONCONSUMPTIVE RECREATION			
Boating/Canoeing	425	425	850
Camping	2,250	1,500	3,750
Hiking	3,575	625	4,200
Picnicking	3,825	3,000	6,825
Sightseeing	1,125	1,575	2,700
4-Wheel Driving	3,450	200	3,650
Snowmobiling	400	25	425
Other[2]	9,000	3,500	12,500
Total Nonconsumptive Recreation Use	**24,050**	**10,850**	**34,900**

TABLE 6 (continued)
ESTIMATED RECREATIONAL USE FOR CALENDAR YEAR 1990 ON ALL PLANNING AREA LANDS[1]

Activity	Resident	Nonresident	Visitor Use Days
CONSUMPTIVE RECREATION			
Hunting			
Elk	7,100	300	7,400
Pronghorn Antelope	550	150	700
Deer	24,000	3,000	27,000
Moose	40	0	40
Sage Grouse	13,360	1,400	14,760
Small game/waterfowl	25,000	0	25,000
Fishing	68,150	76,850	145,000
Trapping	1,450	150	1,600
Total Consumptive Recreation Use	**139,650**	**81,850**	**221,500**
Total Recreation Use	**163,700**	**92,700**	**256,400**

[1]Recreational use is shown in visitor days spent on all lands within the Grass Creek RMP Planning Area. **Nonconsumptive** recreational visitor use is estimated from Big Horn, Hot Springs, Park, and Washakie county data in the 1990 State Comprehensive Outdoor Recreation Plan (University of Wyoming, 1990). **Consumptive** use is based directly on Wyoming Game and Fish Department visitor days estimated for these same four counties, also in calendar year 1990. Extrapolations of the amount of nonconsumptive and consumptive use **taking place on all lands** in the planning area are based on the professional judgment of BLM recreation specialists.

[2]Other activities include bicycling, archery, shooting, sledding, skating, horse riding, crosscountry skiing, outdoor swimming, and water skiing.

TABLE 7
ESTIMATED RECREATIONAL USE FOR CALENDAR YEAR 1990 ON PUBLIC LANDS IN THE PLANNING AREA[1]

Activity	Resident	Nonresident	Visitor Use Days
NONCONSUMPTIVE RECREATION			
Boating/Canoeing	25	25	50
Camping	2,025	1,350	3,375
Hiking	3,200	575	3,775
Picnicking	2,875	2,250	5,125
Sightseeing	1,025	1,400	2,425
4-Wheel Driving	2,950	150	3,100
Snowmobiling	200	25	225
Other[2]	4,600	1,800	6,400
Total Nonconsumptive Recreation Use	**16,900**	**7,575**	**24,475**

TABLE 7 (continued)
ESTIMATED RECREATIONAL USE FOR CALENDAR YEAR 1990 ON PUBLIC LANDS IN THE PLANNING AREA[1]

Activity	Resident	Nonresident	Visitor Use Days
CONSUMPTIVE RECREATION			
Hunting			
Elk	2,600	100	2,700
Pronghorn Antelope	475	125	600
Deer	13,439	1,650	15,089
Moose	11	0	11
Sage Grouse	8,900	1,000	9,900
Small game/waterfowl	21,300	0	21,300
Fishing	2,700	3,100	5,800
Trapping	1,225	75	1,300
Total Consumptive Recreation Use	**50,650**	**6,050**	**56,700**
Total Recreation Use	**67,550**	**13,625**	**81,175**

[1]Recreational use is shown in visitor days spent on public lands within the Grass Creek RMP Planning Area. **Nonconsumptive** recreational visitor use is estimated from Big Horn, Hot Springs, Park, and Washakie county data in the 1990 State Comprehensive Outdoor Recreation Plan (University of Wyoming, 1990). **Consumptive** use is based directly on Wyoming Game and Fish Department visitor days estimated for these same four counties, also in calendar year 1990. Extrapolations of the amount of nonconsumptive and consumptive use **taking place on public lands** in the planning area are based on the professional judgment of BLM recreation specialists.

[2]Other activities include bicycling, archery, shooting, sledding, skating, horse riding, crosscountry skiing, outdoor swimming, and water skiing.

Recreation Opportunities

Recreation opportunities depend on an area's setting and the kinds of activities that could take place. The planning area contains four types of opportunities: semiprimitive nonmotorized, semiprimitive motorized, roaded natural, and rural. See Map 28.

Semiprimitive Nonmotorized

Opportunities for semiprimitive nonmotorized recreation are available on approximately 62,270 acres of public land primarily in remote badlands and along the upper reaches of Owl Creek. These opportunities include solitude in natural environments and activities such as camping, hiking, sightseeing, nature study, hunting, fishing, and watching wildlife.

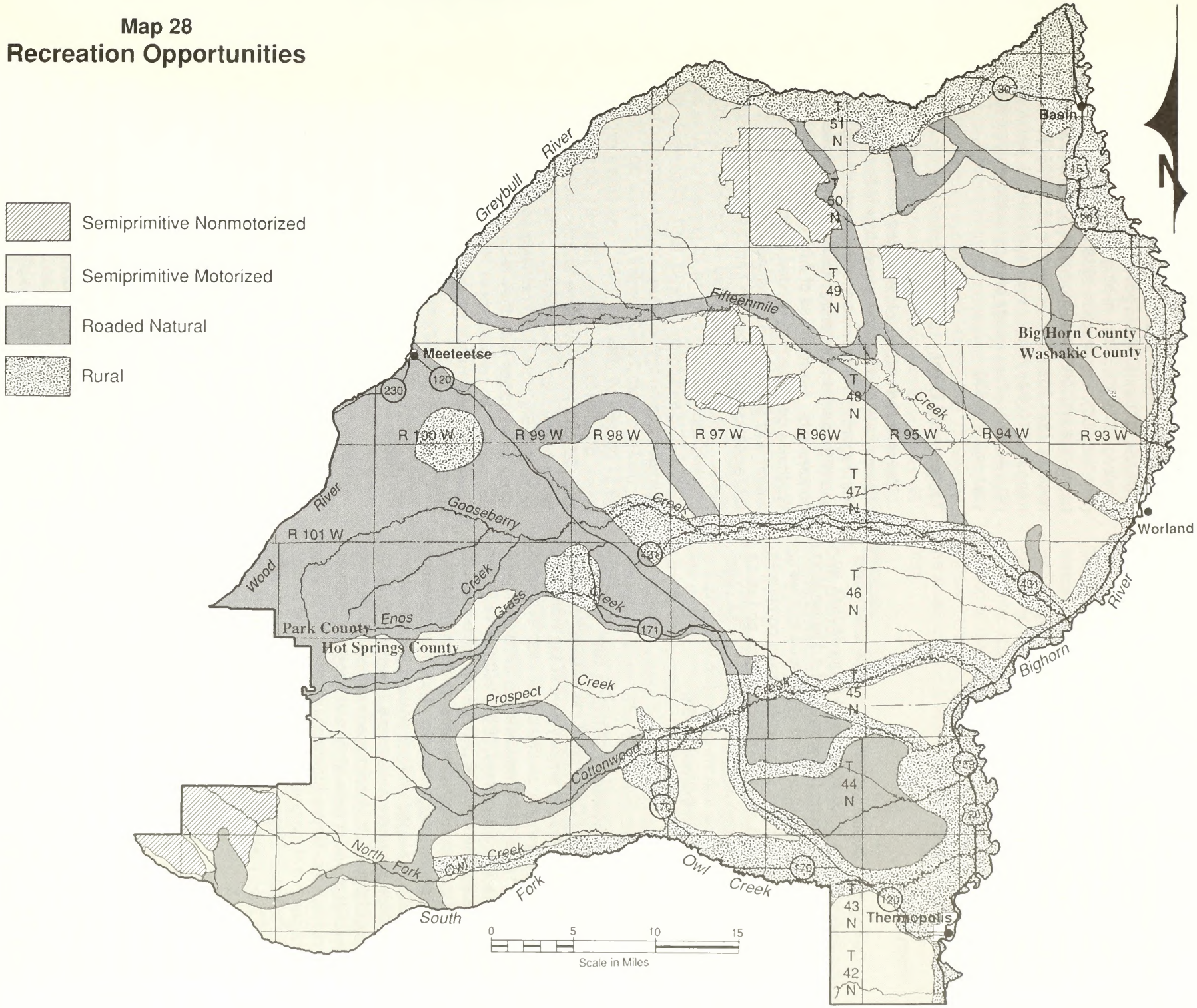
Semiprimitive Motorized

Semiprimitive motorized opportunities are available on approximately 603,150 acres of public land. These opportunities include the use of motorized vehicles in a natural environment for activities such as sightseeing, nature study, camping, hiking, hunting, fishing, and watching wildlife. Most of this activity occurs in badlands and the foothills of the Absaroka Mountains.

Roaded Natural

Approximately 205,580 acres of public land are available for roaded natural opportunities. These opportunities usually involve association with other people in an isolated environment. Activities include picnicking, rock collecting, wood collecting, and driving for pleasure, hunting, and fishing. Roaded natural recreation occurs mainly along gravel and dirt roads.

Map 28
Recreation Opportunities



Rural Opportunities

Rural opportunities are available on about 97,000 acres of public land. These opportunities include association with other recreationists and often involve competitive activities, spectator sports, and bicycling. Rural recreation occurs primarily along main roads and near towns.

Socioeconomics

Population

During 1990, population in the four county area where the planning area is located totaled about 46,800, according to the Wyoming Department of Administration and Information. About one-half of this total was living in Park County. In that same year, males comprised about 50.71 percent of the area's population, and about one-quarter of the population total was 23 to 64 years old. Projections show that the population would have a similar composition in the year 1998.

Employment

The labor force averaged 26,513 in 1990 with employment at 25,173. Over half of this employment was in Park County. Annual employment in Big Horn, Hot Springs, and Washakie counties that year averaged 4,960; 2,730; and 4,288; respectively. Males account for slightly under 56 percent of the labor force in the planning area. Between 96 percent and 97 percent of the labor force is classified by race as white, with most of the remainder being Hispanic. The unemployment rate in 1990 averaged under 5 percent in all counties except Big Horn where it reached 6.6 percent. Over 54 percent of the area's unemployed were males, roughly 93 percent of which were white and about 3.5 percent where Hispanic. Native Americans represented slightly over 2 percent of the unemployed males. Of the unemployed females, about 88 percent where white, over 5 percent were Hispanic, about 1.7 percent were Native American, and about 1.5 percent were Asian American. African Americans accounted for less than 1 percent of the unemployed, either male or female. Area economic sectors employing over 2,000 people in 1990 included government (6,006), services (5,843), retail (4,017), and agriculture (2,305).

Income

Area personal income in the 1990 base year totaled $730,705,000 with over half of this total realized by Park County. The area's total earned 1990 income reached $464,554,000 and included government ($120,803,000), services ($74,950,000), mining ($52,925,000), retail ($44,966,000), construction ($38,302,000), manufacturing ($36,677,000), transportation ($35,146,000), agriculture ($24,232,000), wholesale ($15,134,000), finance ($10,644,000), and agricultural services ($7,484,000). The average area per capita income that year was $15,630.

Taxes and Debt

Taxes levied in 1990 totaled slightly over $44 million of which sales and use taxes were close to $14.2 million. With regard to the area's bonded debt, as of July 1990 and 1991, neither Hot Springs nor Park counties had any bonded debt. However, as of July 1990, Big Horn and Washakie counties had bonded debts of about $1.65 million and $4.54 million, respectively. By July 1991 these debts stood at about $3.7 and $4.2 million, respectively. The amount obligated of Big Horn County's bonding capacity rose from 14.13 percent on June 30, 1990 to 27.8 percent by June 30, 1991. Conversely, the obligated portion of Washakie County's bonding capacity declined from 72.36 percent on June 30, 1990 to 59.57 percent by June 30, 1991. The area's expenditures on education in the 1990-91 period were $53,628,000 while revenues to education during this same period were $52,692,000. This deficit resulted from both Big Horn and Washakie counties spending more on education than they received in revenues for education. In contrast, both Hot Springs and Park counties received more revenue for education than they used.

Medical

While area hospitals during the 1990-1991 period experienced less than a 40 percent occupancy rate, area nursing homes had occupancies of 90 to 99 percent. The area had 57 physicians and certified assistants during this period with about 20 of these in family practice. Ten of the family practice specialists were located in Park County as were most of the other medical specialties in the four county area.

Crime

Crimes per 10,000 population averaged 272.6 in the four-county area with Big Horn County having the lowest incidence (215.4) and Hot Springs County having the highest incidence (353.1). Leading offenses in the area were larceny, burglary, and aggravated assault.

Resources

Recreation

In the 1990 base year, user days of recreation totaled an estimated 256,400 in the four-county area with 81,175 occurring on public lands. While less than 20 percent of all those recreating on public lands were nonresidents, over 36 percent of those recreating on the total four-county area were nonresidents. Only about 14 percent of all those recreating in the four-county area in 1990 were engaged in nonconsumptive activities; about 45 percent were nonresidents. However, it is estimated that 30 percent of those recreating on the public lands within the four-county area were engaged in nonconsumptive pursuits, and that over half of these were nonresidents.

In monetary terms, area recreation resulted in over $5.9 million dollars of economic activity for the four county area in 1990 with about $1.5 million of this related to recreation on area public lands. Nonconsumptive recreation contributed an estimated $684,310 to total area economic activity in 1990 with about $477,755 of this resulting from use of public lands. By comparison, recreational use in 1990 for hunting, fishing, and trapping contributed over $5.2 million to the area economy, including about $1 million from activities on public lands. Recreational use of the four-county area enhanced personal income by a total of $929,123 in 1990 of which public lands accounted for $235,380.

Livestock Grazing

The AUMs of livestock grazing on lands managed-in-common in the four-county area in the base year 1990, totaled 130,926. Other livestock grazing amounted to an estimated 36,900 AUMs for an overall 1990 total of 167,826 AUMs. This level of livestock grazing contributed about $12.94 million to the local economy, including over $2.85 million of personal income, and 225 full-time jobs. Livestock grazing on lands administered by the BLM accounted for about $5.80 million of the total economic impact to the local economy as well as about $1.28 million of the area's total personal income and supported 101 of the area's full-time jobs.

Forestry

In the base year 1990 about 1.1 million board feet of timber (sawlogs 800,000, posts and poles 200,000, and firewood 100,000) was harvested in the four-county area. About 400,000 board feet of this timber was harvested from public lands. This included 300,000 board feet of sawlogs, 50,000 board feet of posts and poles, and 50,000 board feet of firewood.

The total harvest of sawlogs, posts, and poles in the area in 1990 added about $768,590 to the local economy, including $164,380 in personal income and ten full-time jobs. The portion of this timber harvested on public lands accounted for about $269,007 of the total area economic activity that year, $57,533 of personal income, and 3.5 full-time jobs. The contribution of firewood to the area's economic activity is not estimated here because the portion of the harvest that is sold commercially is not known. However, it would not be significant because of the small amount of firewood harvested annually in the area.

Minerals

Coal production: Coal production totaled 100,000 short tons in 1990, raising the area's economic activity by over $1.74 million that year. It also supported about eleven full-time area jobs. BLM-administered mineral estate lands accounted for approximately one-half of this coal production and the resulting economic impacts.

Gas and oil production: Gas output in 1990 totaled 7.6 billion cubic feet, contributing over $19.15 million to the local economy, including almost $1.75 million in personal income. The BLM-administered mineral estate accounted for over 84 percent of these totals. Approximately 68 full-time jobs were supported by area gas output that year with public lands supporting about 58 of these.

In 1990, oil output in the planning area totaled about 7.6 million barrels, adding almost $212.65 million that year to the local economy. About three quarters of this output and economic impact can be attributed to production on public lands. This oil output also added about $19.38 million to area personal income with about $14.03 million of this attributed to output from BLM-administered mineral estate lands. In addition, 1990 area oil production supported 760 full-time local jobs of which about 550 were supported by public lands.

Gas and oil expenditures: Wildcat gas and oil well expenditures in 1990 added an additional $1 million in economic impacts, including about $166,004 in personal income, and between six and seven jobs to the local economy. Over 50 percent of these expenditures and impacts were related to wildcatting activities on BLM-administered mineral estate lands.

Gas and oil production wells added $997,667 in impacts, $78,218 in personal income, and between two and three jobs to the local economy in 1990. BLM-administered mineral estate lands accounted for over 50 percent of these totals.

Gas and oil operating activities in the planning area provided a further $38.42 million to the area economy,

including almost $9.4 million in personal income, and roughly 250 full-time jobs. Only about 5 percent of these impacts can be attributed to BLM-administered mineral estate lands.

Soils and Water

Soils

The soils of the planning area are extremely variable, reflecting the differences and interactions between parent material, topography, vegetation, climate, and time. Five of the eleven soil orders have been identified in the planning area; aridisols, entisols and molisols predominate. Soils are light colored at low elevations and become darker with organic matter as elevation and precipitation increase. Shallow soils, less than 20 inches deep, are common in the planning area.

Parent material has a profound effect on soils in the Bighorn Basin. Many soils are formed on interbedded shale and sandstone. These soils are often high in salts and gypsum and have low productivity especially at low elevations in salt desert shrub and salt bottom vegetative communities. As elevation and precipitation increase these soils become more developed and produce more vegetation.

Soils formed on alluvial deposits are also common in the planning area. These soils are often over 60 inches deep. The youngest alluvial soils along the major rivers and creeks are weakly developed with the original sediment layers frequently visible. Older alluvial soils are found on gravel terraces above the Greybull and Bighorn rivers.

Landslide Potential

Along the eastern slope of the Absaroka Mountains and at Tatman Mountain, poorly consolidated soils are prone to landslides. A landslide is a rapid down slope movement of a mass of land, soil, debris, mud, or rock under the influence of gravity. The rate of movement can be fast or slow. Soil moisture, rock type, slope angle, and earthquake potential are factors contributing to landslides (Case 1986). Types of landslides include creep, slump, earthflow, mudflow, rock fall, and debris avalanche.

Map 29 shows lands that are susceptible to landslides, where numerous slides have occurred within the past 15,000 years. The largest area prone to landslides is along the Absaroka Mountains. The soils and geology here are dominated by weak volcaniclastic rocks such as conglomerates, breccias, sandstones, tuffs, siltstones, and alluvium. Many of the slopes are steep and unstable. These factors combined with moist soils increase the potential for landslides. Slump and earthflows are the most common types in this area followed by rock falls and rock slides.

A second landslide area is Tatman Mountain in the north-central portion of the planning area. The primary types of downslope movements in this area are slumps and earthflows. Neither Tatman Mountain nor the eastern slopes of the Absaroka Mountains are considered prone to earthquakes.

Erosion

Erosion is the wearing away of the land surface by water, wind, ice, or other geologic agents and processes. Erosion is generally described as natural or accelerated. Natural erosion is the geologic erosion that occurs under natural conditions of climate and vegetation undisturbed by human activities. Accelerated erosion is the direct result of human activities. Determining where natural erosion ends and accelerated erosion begins is difficult and often controversial.

Vegetative cover is extremely important in controlling erosion. Vegetative cover also has the greatest potential for management. This cover includes live plants and organic litter. Cover intercepts precipitation reducing rain drop impact and restricts overland flow. This allows for greater infiltration and less runoff, reducing erosion.

Organic litter, in addition to being an important component of cover, contributes to the overall health of the soil by adding nutrients and improving soil structure. Improved soil structure allows soil to absorb more water. Research has demonstrated that at least 30 to 40 percent of the surface must be covered by vegetation to control erosion.

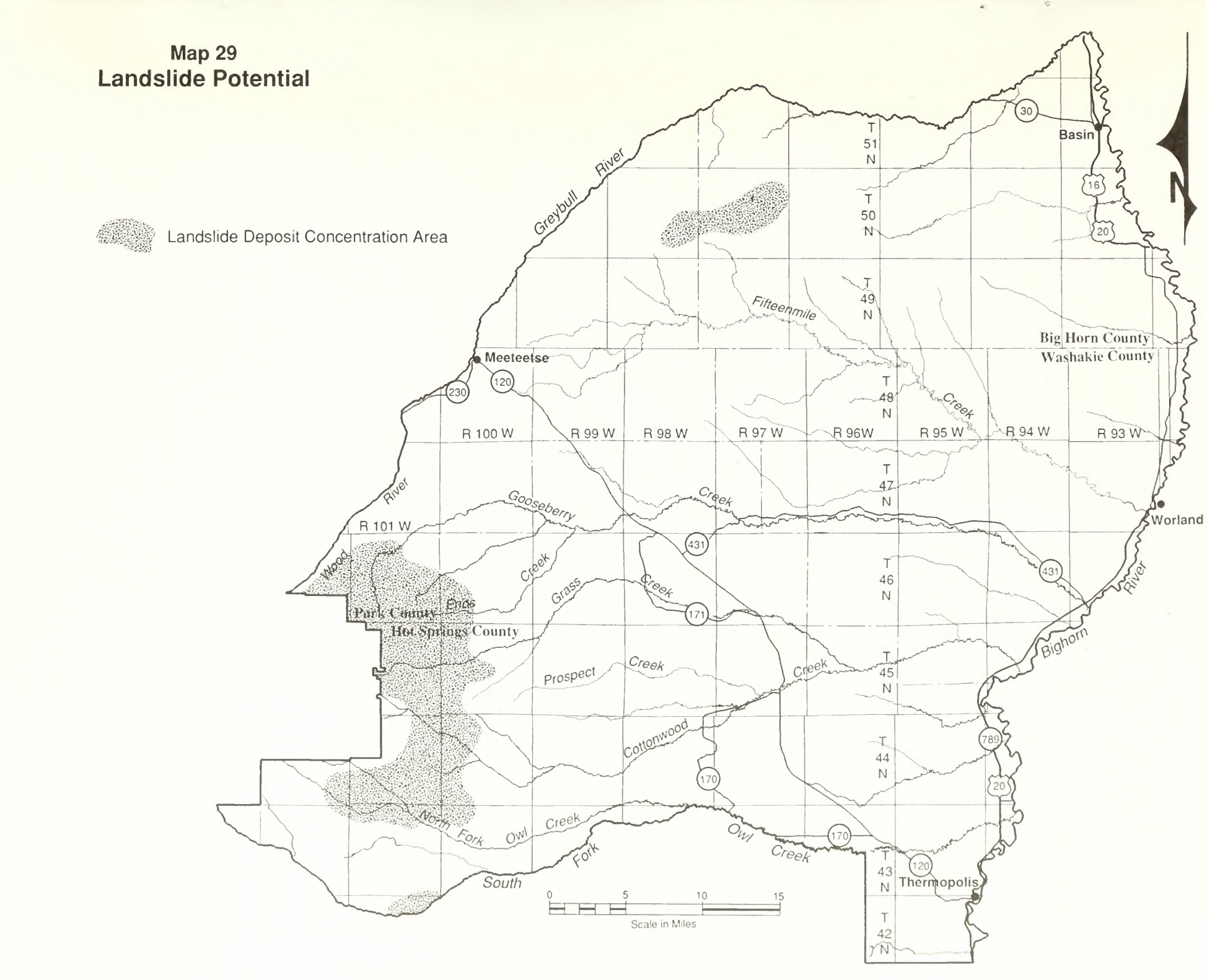
Upland cover is generally sufficient to control erosion where precipitation exceeds 10 inches. In the 5- to 9-inch precipitation zone, characterized by the Basin Grassland/Shrub and Salt Desert vegetative communities, cover is marginal for controlling erosion.

Where erosion has not been controlled, the formation of gullies further increases the magnitude and frequency of runoff and erosion.

The *Revised Universal Soil Loss Equation* (Renard et al. 1991) was used to estimate the soil loss for sheet and rill erosion associated with various land uses in the planning area. The equation does not predict the levels of two other types of erosion, gully and streambank.

Erosion rates estimated by the equation indicate that under conditions of average slope and cover, erosion on

Map 29
Landslide Potential



upland range sites varies from 0.1 to 2.0 tons per acre per year. This analysis further indicates that on some range sites erosion is exceeding the rate of soil formation. These range sites are the shallow loamy, loamy, and saline upland in the 5- to 9-inch precipitation zone and the shallow loamy and saline upland in the 10- to 14-inch precipitation zone. These range sites are in the Basin Grassland/Shrub, Salt Desert, and the Foothills-Mountain Grassland/Shrub vegetative communities.

Erosion in the planning area is not limited to the sheet and rill erosion predicted by the *Revised Universal Soil Loss Equation*. Based on estimates by the USGS in the *208 Water Quality Plan for the Big Horn Basin*, only 25 percent of the sediment in the Bighorn River can be attributed to sheet and rill erosion. Gully and streambank erosion would account for the remaining 75 percent. In 1990, estimated **accelerated** sheet and rill erosion for surface-disturbing activities and livestock grazing was about 365,010 tons per year. By comparison, the total estimated **accelerated and geologic** erosion from all sources (including sheet, rill, gully, and streambank erosion) is much greater. In 1990 this total estimated erosion was about 4,764,320 tons per year. It is estimated that only about 10 percent of this total erosion would be delivered to streams.

Table 8 shows estimated accelerated sheet and rill erosion, as of 1990, for various activities.

TABLE 8
ACTIVITIES AFFECTING SOILS AND ESTIMATED ACRES AND DURATIONS OF DISTURBANCE

Activity	Acres of Disturbance	Soil Loss[1] tons per acre per year	Duration of the Impact[2]
Cultural/Paleontological Resources	5 per site	17	temporary
Fire Management			
Wildfire suppression	60	12.0	temporary
Prescribed fire	300	4.9	temporary
Forestry			
Clearcut logging	500	7.5	long term
Selective cut logging	1,000	2.8	long term
Landing	0.5per landing	2	temporary
Logging road	3 per mile	7.3	long term
Skidding road	3 per mile	9.2	temporary
Lands and Realty			
Power line	1 per mile	10	permanent
New road	4.8 per mile	2.1	permanent
Pipeline	2 per mile	24	permanent
Structures	2 per site	5	permanent
Livestock Grazing	968,000	0.3	temporary
Minerals			
Oil and Gas Activity			
New production well	3.5 per well	5	permanent
Access to well	2 per mile	2.1	permanent
Exploratory well	3.5 per well	17	temporary
Access to well	6 per mile	7.7	temporary
Existing well	1.5 per well	1.2	permanent
Access to well	0.5 per mile	2.1	permanent

TABLE 8 (continued)
ACTIVITIES AFFECTING SOILS AND ESTIMATED ACRES AND DURATIONS OF DISTURBANCE

Activity	Acres of Disturbance	Soil Loss[1] tons per acre per year	Duration of the Impact[2]
Minerals (continued)			
Seismic exploration	1 per mile	5.5	temporary
Flowlines	1 per mile	17	temporary
Batteries	3 per site	1.2	permanent
Locatable Minerals			
Bentonite	50 per mine	17	long term
Salable Minerals			
Sand and Gravel	30 per mine	17	long term
Moss Rock	5 per quarry	1	permanent
Flagstone	5 per quarry	1	permanent
Recreation			
Concentrated ORV Use	900	40	permanent
Road	4.8 per mile	2.1	permanent
Two-track	1.5 per mile	10	permanent

[1]Soil loss is the removal of the productive layer of soil caused by erosion or by direct human activity such as road construction. This removal reduces the potential of the site for reclamation.

[2]Temporary impacts last for fewer than 5 years, long-term impacts are from 5 to 15 years, and permanent impacts last longer than 15 years.

Soil Productivity

Soil productivity is the capacity of a soil to produce a specific plant or a community of plants. For rangelands, site productivity is the capability of a soil to produce a native plant community. Production, which measures productivity, is expressed as pounds per acre air-dry weight of vegetation that is grown. It ranges from 200 pounds per acre for a very shallow 5- to 9-inch precipitation zone to greater than 2,300 pounds per acre in some riparian areas.

Though precipitation has a profound effect on productivity, soil plays an important secondary role. Factors effecting soil productivity are soil depth, horizon differentiation, rock weathering rates, soil organic matter, acidity, and salinity. Unlike agricultural soils, there are few opportunities to improve the productivity of rangeland soils through the use fertilizers. Productivity lost through soil erosion is a long-term adverse effect.

Production can be used as an indicator of a soil's responsiveness and vulnerability. Generally, soils with higher production rates respond positively to changes in management and are not as vulnerable to loss of productivity from use. Likewise, a soil with low productivity is more vulnerable, is more easily damaged, and is less likely to respond positively to changes in management. Production can also be used as an indicator of the reclamation potential of a particular site following disturbance.

Water Resources

Groundwater

The BLM has developed approximately 63 wells from formations including the Fort Union, Mesaverde, Lance, and Willwood. These formations yield well water ranging from 5 gallons per minute to more than 20 gallons per minute of suitable quality for livestock and wildlife. Many wells are not functioning because of deterioration over time.

Surface Water

The watersheds of the planning area are shown on Map 30. With the exception of Fifteenmile Creek, the large watersheds are perennial and have their headwaters in the Absaroka Mountains. The smaller ephemeral watersheds and Fifteenmile Creek have their headwaters in the semiarid rangeland of the basin. The percentages of BLM-administered lands in watersheds and along major waterways are shown in Table 9.

Table 10 lists the uses of streams and rivers in the planning area as determined by the Wyoming DEQ, and includes DEQ's and WGFD's classification of these waters.

TABLE 9
WATERSHEDS OF THE PLANNING AREA[1]

Watershed	Watershed			Stream System	
	Total	Public		Total	Public
	Acres	Acres	Percentage	Miles	Miles
Perennial waters					
Bighorn River	1,485,700	968,000	65	1,299	506
Greybull River	168,012	84,562	50	53	23
Gooseberry Creek	219,865	129,848	59	248	36
Cottonwood Creek	170,400	109,135	64	208	72
Grass Creek	88,726	50,567	57	95	9
Owl Creek	156,156	58,352	37	250	67
Intermittent/Ephemeral waters					
Elk Creek	62,338	58,690	94	33	30
Fivemile Creek	27,692	22,571	82	21	16
Tenmile Creek	20,446	19,654	96	8	7
Fifteenmile Creek	333,381	274,273	82	293	193
Coal Draw	43,661	34,530	79	37	11
Sand Draw	30,474	25,257	83	18	13
Red Canyon Creek	7,538	4,957	66	1	06
Miscellaneous Tributaries	152,295	88,959	58	25	18

[1]Drainage areas and stream miles are for those portions of the watersheds and streams contained in the planning area.

TABLE 10
USES AND CLASSIFICATIONS OF STREAMS IN THE PLANNING AREA

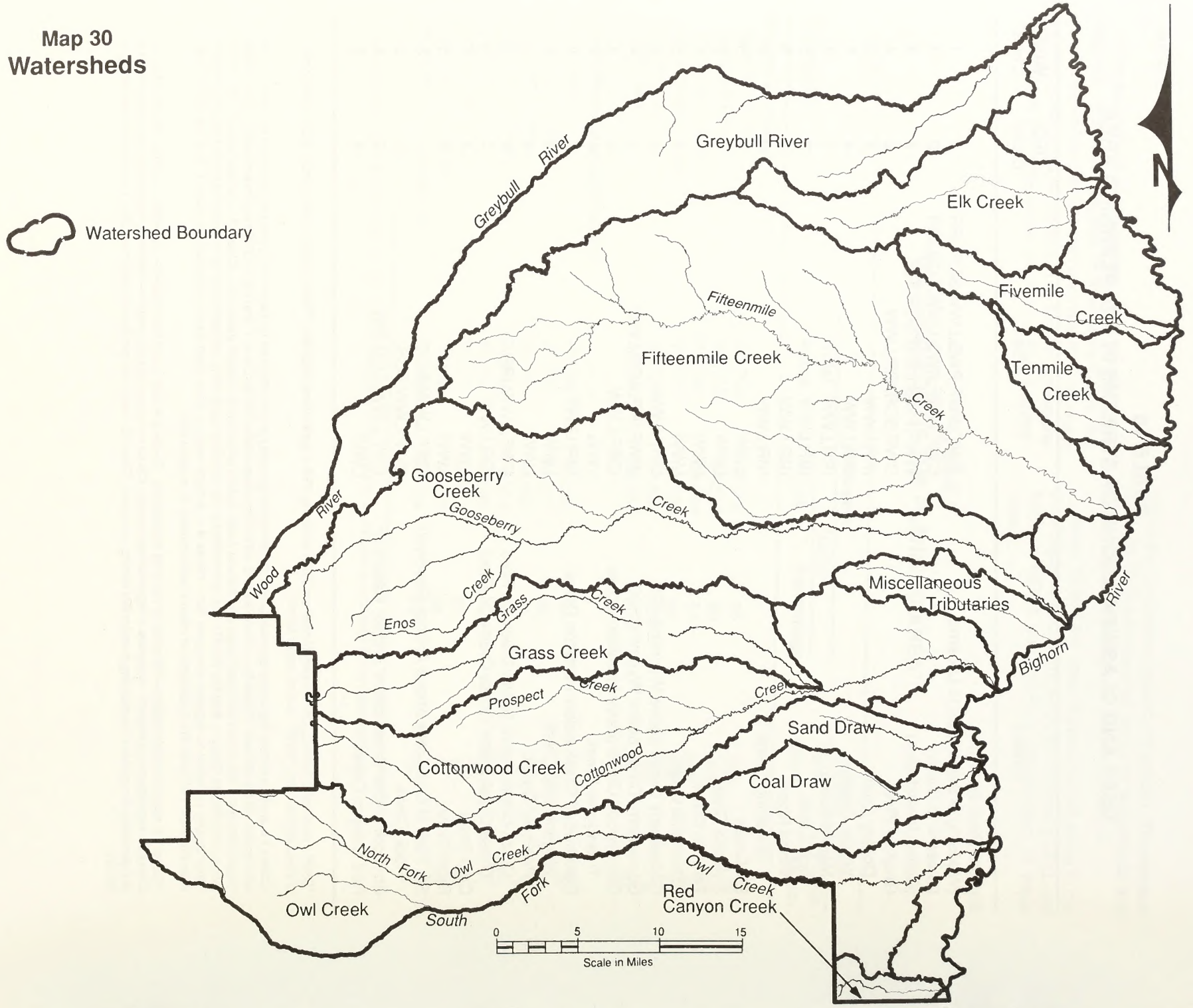
Stream	Uses[1]	DEQ Class[2]	WGFD Class[3]
Bighorn River from ...			
(Wedding of the Waters to Lucerne)	CWF,WWF,PWS,LWW,SCR,IRR	2	1
(Lucerne to Colter)	CWF,WWF,PWS,LWW,SCR,IRR	2	3
(Colter downstream)	WWF,PWS,LWW,SCR,IRR	2	4
Greybull River	CWF,SCR,IRR,LWW	2	4
Dorsey Creek	IRR,LWW	4	5
Willow Creek	IRR,LWW	4	5
Magee Gulch	IRR,LWW	4	5
Iron Creek	IRR,LWW	2	5
Wood River	IRR,LWW	2	3
Sunshine Creek	IRR,LWW	2	4
Elk Creek	LWW	4	5
Fivemile Creek	LWW	4	5
Tenmile Creek	LWW	4	5
Fifteenmile Creek	LWW	4	5
Gooseberry Creek above Wyoming 120	CWF,LWW	2	3
Gooseberry Creek below Wyoming 120	WWF,IRR,SCR,LWW	3	4
Cottonwood Creek above Hamilton Dome	CWF,LWW	2	4
Twentyone Creek	LWW	4	4
Cottonwood Creek below Hamilton Dome	IRR,LWW	4	4
Wagonhound Creek	LWW	4	4
Prospect Creek	LWW	4	4
Grass Creek above Grass Creek Oil Field	CWF,LWW,IRR	2	3
Grass Creek below Grass Creek Oil Filed	IRR,LWW	4	3
Coal Draw	LWW	4	5
Sand Draw	LWW	4	5
So. Fork of Owl Creek above Anchor Reservoir	CWF,LWW,SCR	2	3
Rock Creek	CWF,LWW,SCR	2	3
So. Fork of Owl Creek below Anchor Reservoir	CWF,LWW,SCR,IRR	2	4
Red Canyon Creek	LWW	4	5

[1]CWF = cold water fishery; LWW = livestock and wildlife watering; IRR = agricultural irrigation; PWS = public water supply; SCR = secondary contact (recreation); WWF = warm water fishery.

[2]**Class 1** = surface waters that are to be maintained at their existing quality and in which no further water quality degradation by point source discharges will be allowed. **Class 2** = surface waters, other than those classified as Class 1, that the WGFD has determined to be currently supporting game fish or to have hydrologic and natural water quality potential to support game fish. **Class 3** = surface waters, other than those classified as Class 1, that the WGFD has determined to be currently supporting nongame fish or to have the hydrologic and natural water quality potential to support nongame fish. **Class 4** = surface waters, other than those classified as class 1, that the WGFD has determined to not have the hydrologic or natural water quality to support fish.

[3]**Class 1** = premium trout waters—fisheries of national importance. **Class 2** = very good trout waters—fisheries of statewide importance. **Class 3** = important trout waters—fisheries of regional importance. **Class 4** = low production waters—fisheries frequently of local importance but generally incapable of sustaining substantial fishing pressure. **Class 5** = very low production waters—often incapable of sustaining a fishery.

Map 30
Watersheds



Water quality data is limited for the planning area; however, samples collected on the major waterways from 1982 through 1986 reveal good water quality in the headwater regions with a gradual deterioration downstream. Reductions in water quality are related to increased sediment from erosion and the addition of salts, pesticides, and bacteria from erosion and other sources. Sediment in streams also reduces the life of reservoirs and water treatment facilities, degrades fisheries and recreation resources, and increases water treatment costs.

Sources of salinity in the planning area include natural contributions from saline shales and from water discharges at oil production facilities. There are about 40 active produced water discharges in the planning area. These have created 13 miles of riparian habitat on public lands in otherwise dry stream channels. Produced water, however, is the major source of human-caused salinity and a source of other pollutants such as radioactive material, oil and grease, and settleable solids, including iron sulfide and oil coated sediments.

Bacterial contamination from human and livestock sewage is present in nearly all waters of the planning area (Cooper, 1979). Other pollutants and toxins have occasionally been identified in the planning area in low concentrations.

Various watershed treatments have been constructed to address erosion and sedimentation concerns. The majority were constructed in the Fifteenmile watershed during the late 1950s and early 1960s. There are 34 detention dams to collect and store sediment, 21 water spreader systems to distribute runoff, and contour furrowing on 6,143 acres to reduce surface runoff. Most of these are no longer serving their original purposes.

Vegetation

Forestland Vegetation

The planning area contains about 59,000 acres of woodlands and forestlands. Woodlands have at least a 10 percent crown cover of trees. Commercial forestlands are defined as being capable of producing 20 cubic feet of wood per acre per year of a commercial species. There are about 45,000 acres of woodlands and 14,000 acres of commercial forestlands on public lands in the planning area.

Woodlands

Most woodlands in the planning area are associations of juniper and limber pine. Generally, these woodlands are on the west side of the planning area, downslope from commercial forestlands. In these areas, woodlands are encroaching on foothills-mountain/grassland shrub and basin/grassland shrub communities. Aerial photos indicate that along the upper part of Grass Creek, woodland canopy cover increased about 210 percent between 1953 and 1989; although in the mid-1980s, a mountain pine beetle epidemic killed a large portion of the limber pine in the planning area.

Commercial Forestland

Commercial forestlands in the planning area comprise five main forest types. These are mixed conifer/Douglas-fir, spruce/fir, lodgepole pine, limber pine, and aspen.

Mixed Conifer/Douglas-Fir. Most of the commercial forestland is mixed conifer/Douglas-fir covering about 7,200 acres in the planning area. The stands are typically found on north-facing ridges. There are very few young mixed conifer stands; those that exist are the result of past harvests. Most harvests have been of this timber type.

Spruce/Fir. Stands of Engelmann spruce and subalpine fir are found in the higher elevations of the planning area, particularly in the upper Owl Creek watershed. These stands occupy about 4,000 acres of public lands on north-facing slopes and in riparian areas.

Lodgepole Pine. Lodgepole pine stands occupy about 1,400 acres. Most of these stands originated because of fires or have regenerated on clearcuts. Those stands that regenerated from fire are now stagnated pole stands that are heavily infested with dwarf mistletoe. These stands lack diversity and can not be improved by thinning.

Limber Pine. Limber pine stands in the higher elevations occupy more productive sites than lower elevation limber pine woodlands. Higher elevation stands that contain commercial quality Douglas-fir are classified as commercial forestland. About 1,200 acres of limber pine are classified as commercial forestland.

Aspen. Aspen stands comprise a small but important part of the total forestland. There are only about 200 acres of aspen on public lands in the planning area. These stands are typically old and are being replaced by conifers.

There are many small stands of mature aspen in areas that are predominantly conifer. These mature aspen are dying, however, stands with good potential for reestablishment have been identified. Over 2,000 acres could support aspen reestablishment. Aspen stands are beneficial for livestock forage, wildlife habitat, visual, and recreational values.

Factors Affecting Forestland Condition

General Factors. The forestland as a whole is not producing up to capability because of stagnation, insect and disease problems, old age, and overall declining condition of the stands. Only about 1,300 acres of public forestland in the planning area have been disturbed during the past 100 years by fire or harvesting which would cause the stands to regenerate or convert to earlier successional stages.

Forestlands that have been harvested are concentrated in areas that are legally and physically accessible. Between 1963 and 1970, many of the easily accessible commercial stands in the planning area were harvested. Most of these were two-stage shelterwood cuts in which some of the forest canopy was left to provide shade for the establishment of new trees. Generally, these stands are ready for the second-stage harvest to maintain their productivity.

Factors Affecting Aspen. Aspen stands occur at early seral stages in the forest ecosystem. Aspen typically regenerate from root sprouts in response to a disturbance, such as fire or timber harvest, which opens the forest canopy. In addition to opening the forest canopy, fire removes conifers that can make soils too acid for aspen. In the planning area, many aspen stands have succeeded to conifers because disturbance has been reduced and young trees have been browsed by wildlife and livestock.

Rangeland Vegetation

Communities

Figure 2 lists vegetative communities and cites the generally "preferred, undesirable, and component" plants for each. **Preferred** species are those that have been identified as "key species" in previous land use plans. These plants maintain soil, water, forage, and wildlife values for a healthy ecosystem. **Undesirable** species are normally unwanted in the plant community, or are acceptable only in small quantities. **Component** species are valuable in limited quantities, but become undesirable if they replace preferred species as major components in the plant community.

Desired Plant Community (DPC). The traditional method of evaluating rangelands is to compare the existing vegetation community to the potential natural community. Through this comparative analysis rangeland condition can be determined. While this continues to be a viable approach for evaluating rangelands, there are circumstances where the desired plant community will differ from the potential natural community. For example, on antelope winter range a desired plant community objective may be to increase the amount of existing sagebrush. Meeting this objective could actually lower the range condition.

Desired plant community objectives are based on a study of existing plant communities in other areas. Throughout the RMP analysis, desired plant community objectives vary according to percentages of grasses, forbs, and shrubs for each of the plant communities discussed in Figure 2. In site-specific land use planning, composition, production, cover, frequency, and density also may be used to describe the community.

Riparian Function. Riparian areas store water, trap sediment, produce forage, and maintain biological diversity. Riparian areas are functioning properly when adequate vegetation, rocks, or large woody debris are present to dissipate stream energy associated with high water flows, thereby reducing erosion and improving water quality. The total number of riparian acres on public lands in the planning area is about 2,260; data is insufficient to classify about 40 (1.7 percent) of those acres.

Properly-functioning riparian areas are stable ecosystems that can be managed for many types of habitat and land uses. When a riparian area is functioning properly, a variety of desired plant community objectives can be developed. For example, the plant community objectives could vary depending on whether the area is managed for moose habitat or for cattle grazing. In the planning area, about 1,140 acres (50 percent) of the riparian areas on public lands are in properly-functioning condition.

Functioning-at-risk riparian areas are functioning but are unstable and vulnerable to damage; they may have a downward or an upward trend. The primary management objective for riparian areas that are functioning-at-risk is to improve the stability and resilience of the areas through changes in management. These changes are intended to produce a properly-functioning condition. Functioning-at-risk riparian areas having a downward trend are a high priority for management because riparian stability and important resource values could be lost. Areas having an upward trend should be intensively monitored until they function properly. In the planning area, about 850 acres (37 percent) of riparian areas on public lands are functioning-at-risk. Of this amount, 240 acres have an upward trend and 610 acres have a downward trend.

Nonfunctioning riparian areas are those in which most resource values have been lost and the condition is stable or on a downward trend. The immediate objective for nonfunctioning riparian areas is to achieve a functioning-at-risk condition. Any type of vegetation that

FIGURE 2
RANGELAND DESIRED PLANT COMMUNITIES

PLANT COMMUNITY		PREFERRED	UNDESIRABLE	COMPONENT
SALT DESERT SHRUB: This community occupies uplend sites on soils cherecterized by high salt content.		Gerdner's seltbush Indien ricegress Rhizometous wheetgress Squirrelteil	Helogeton Prickly pear cactus Annuel forbs	Bud segebrush Birdsfoot segebrush
SALT BOTTOM: This community occupies lowlend sites often associated with streem terreces. These ere often poorly dreined end tend to eccumulate selts.		Besin wildrye Alkeli seceton Rhizometous wheetgress Cenede wildrye Big segebrush	Prickly peer cectus Russien olive Selt cedar Cheetgress	Greesewood Rabbitbrush Blue greme Inlend seltgress
BASIN GRASSLAND/SHRUB (high and low density segebrush): This community occupies uplend sites generelly in the 5" to 9" precipitetion zone, on well-dreined sites thet are not cherecterized by seline soils.		Bluebunch wheatgress Indien ricegress Needle-end-threed gress Winterfet Big segebrush	Larkspur Halogeton Cheetgrass Annuel forbs Prickly peer cectus	Blue greme Rhizometous Perenniel forbs wheetgress Sendberg bluegress Preirie junegress
FOOTHILLS-MOUNTAIN GRASSLAND/SHRUB: This community occupies uplend sites generelly in the 10" to 14" end the 15" to 19" precipitetion zones thet ere not cherecterized by seline soils.		Green needlegrass Bluebunch wheetgress Spike fescue Ideho fescue Needle-end-thread gress	Prickly peer cectus Annuel forbs Blue grema Larkspur	Big segebrush Prairie junegress Bluegresses Rhizometous wheetgress Threedleef sedge Perenniel forbs
BARREN AND ALPINE: Berren erees include bedlends end rock outcrops mostly without vegetetion. Alpine communities occur ebove tree line.		No preferred, undesireble end component species heve been identified for these communities.		
RIPARIAN/COTTONWOOD: Riperien vegetetion veries besed on slope, soil, end other fectors such es topogrephical confinement. Vegetetion cen change by locetion on the seme streem. Four riperien types will be considered in this RMP.	**High Gredient/Rocky**	**Low Gredient/Alluviel**	**Intermediate**	**Desert Cottonwood**
	These sites often comprise "chutes" with large boulders, straight V-shaped chennels, and without significent floodplains. Activity plens rarely address these sites, consequently no species analysis is included for this type.	These sites ere cheracterized by wet meedows with elluviel soils end exaggereted stream chennel meenders. Broed floodpleins ere domineted by herbeceous vegetetion. These sites ere vulnereble to heedcutting. Wet meedows, not directly essocieted with streems, ere pert of this type. Preferred: Sedges, Rushes, Bulrushes, Willow, Riparian wheatgrasses Undesirable: Kentucky bluegrass, Pussytoes, Dandelions, Mat muhly, Upland vegetation Component: Cattails, Spike top sedge, Redtop, Woods rose, Gooseberry, Biannual & perennial forbs	The majority of the perennial streams and springs in the planning area support vegetation characteristic of this type. While these sites do not have wet meadows characteristic of the low gradient type, they form functional floodplains, potentially dominated by riparian shrubs and trees. These sites are highly responsive to management actions and are vulnerable to either headcutting and channel widening, depending on the soil substrate. Preferred: Sedges, Rushes, Bulrushes, Willow, Tufted hairgrass, Cottonwood, Alder, Water birch, Silverberry Undesirable: KY bluegrass, Pussytoes, Dandelions, Mat muhly, Upland vegetation Component: Red top, Spike top sedge, Riparian wheatgrass, Native bluegrass, Gooseberry, Woods rose, Conifers, Biannual & perennial forbs	Many stream channels with high water tables, but without permanent surface water exhibit cottonwood ecosystems. These site are ecologically complex and often difficult to interpret. Generally when these sites are in a deteriorated condition they produce no riparian vegetation. Preferred: Sedges, Rushes, Bulrushes, Canada wildrye, Alkali sacaton, Riparian wheatgrass, Great Basin wildrye, Willow, Cottonwood Undesirable: Annual forbs, Upland veg., Tamarisk Component: Redtop, Spike top sedges, Gooseberry, Woods rose, Skunkbush, Rabbitbrush

promotes riparian values would be desirable. In the planning area, about 270 acres (13 percent) of riparian areas on public lands are not functioning.

Structural Diversity and Appearance of Desired Plant Communities

Uplands. Regardless of the composition of the desired plant community an adequate standing crop of vegetation is important during all seasons of the year to maintain livestock diet quality, wildlife habitat, watershed condition, and scenic values. After grazing, some standing crop of preferred grasses should remain in open spaces between shrubs.

On mule deer, pronghorn antelope, and bighorn sheep winter ranges, an adequate amount of the current year's vegetation growth should be maintained on browse species to meet the physiological needs of shrubs and to provide forage for livestock and wildlife. It is undesirable for shrub communities to be severely browsed.

Riparian Areas. Riparian communities capable of supporting woody plants such as willows and cottonwoods should consist of individual plants in different age and height classes to provide structural diversity and to maintain healthy reproducing populations. An adequate amount of the current year's growth should be maintained on woody species to meet the physiological needs of the plants and to provide forage for livestock and wildlife in the following year. The presence of severely hedged woody species is undesirable.

An adequate standing crop of herbaceous (nonwoody) riparian plants should remain after grazing to maintain watershed condition, diet quality for livestock, wildlife habitat quality, scenic values, and other multiple use benefits of riparian areas.

Noxious Weeds

The Wyoming Department of Agriculture and the County Weed and Pest Districts have conducted systematic weed surveys in the planning area. Identified noxious weeds are: Canada thistle, musk thistle, plumeless thistle, scotch thistle, perennial sowthistle, Russian knapweed, hoary cress (whitetop), common burdock, houndstongue, spotted knapweed, and leafy spurge. In 1976 an estimated 50 acres were infested with noxious weeds. Since that time Russian knapweed has infested hundreds of acres along the Bighorn River and is common along Gooseberry Creek. It is anticipated that other noxious weed species and affected areas will be discovered.

Special Status Vegetation

The planning area is not known to contain any designated threatened or endangered plant species. However, there are plants that are or have been candidates for threatened or endangered listing. These plants are generally found in locations based on geology, elevation, and climate. Some of these plants occur in large numbers in a few areas while others are rare throughout the planning area. (See Table 11.)

TABLE 11
SPECIAL STATUS PLANT SPECIES AND COMMUNITIES

Plant (Common Name)	Category[1]	Location/Potential for Presence in Planning Area
Aromatic pussytoes	3C	T. 52 N., R. 102 W., section 8
Branched fleabane	3C	Known to occur outside the planning area, has potential to occur in the planning area.
Contracted ricegrass	2C	T. 43 N., R. 100 W., section 18
Subcapitate miner's candle	2C	Known to occur outside the planning area, has potential to occur in the planning area.
Evert's waferparsnip	3C	T. 47 N., R. 99 W., section 2
Jones's columbine	3C	Known to occur outside the planning area, has potential to occur in the planning area.
Moll's aster	2C	Known to occur outside the planning area, has potential to occur in the planning area.
Persistent sepal yellow cress	3C	T. 48 N., R. 93 W., section 5
Shoshonea	2C	T. 52 N., R. 102 W., section 7

TABLE 11 (continued)
SPECIAL STATUS PLANT SPECIES AND COMMUNITIES

Plant (Common Name)	Category[1]	Location/Potential for Presence in Planning Area
William's waferparsnip	2C	Known to occur outside the planning area, has potential to occur in the planning area.
Wyoming tansymustard	2C	T. 49 N., R. 103 W., section 20
Yellow springbeauty	2C	Known to occur outside the planning area, has potential to occur in the planning area.
Wagonhound Flat ponderosa[2] pine stand		Wagonhound Flat
Hamilton Dome serviceberry area[2]		Hamilton Dome

[1]**2C** = Some evidence exists that the plant is vulnerable but not enough information to support listing. **3C** = The plant is more abundant than previously thought and is no longer considered for listing.

[2]Some plant communities contain species not commonly found in the planning area, including ponderosa pine at Wagonhound Flat and serviceberry at Hamilton Dome. These plant communities are important for providing biological diversity.

Vegetation Inventory and Ecological Range Condition

A vegetation inventory was conducted in the planning area from June 1977 to October 1979. Ecological condition is the current vegetative composition compared to the potential natural community for an area and is synonymous with range condition. Improvement of ecological condition has traditionally been a resource condition objective. Areas where ecological condition is evaluated are called range sites. Range sites differ in their potential to produce vegetation based on soil type and precipitation.

Plant communities, range sites, and ecological condition classes for the planning area are displayed by acres on Table 12. Map A (in the map pocket) shows plant communities based on satellite imagery.

TABLE 12
PLANT COMMUNITIES AND ECOLOGICAL CONDITION IN THE PLANNING AREA

Plant Community Range Site	Precipitation Zone	Total Acres	Ecological Condition Classes[1]									
			Potential Natural Community		Late Seral		Middle Seral		Early Seral		Not Classified[2]	
			Acres	Percentage	Acres	Percentage	Acres	Percentage	Acres	Percentage	Acres	Percentage
Basin Grassland/Shrub (high and low density sagebrush)												
Sandy	5-9"	79,119	0	0	10,360	13	65,735	83	3,024	4	0	0
Shallow sandy	5-9"	20,858	0	0	4,507	22	14,184	68	2,167	10	0	0
Loamy	5-9"	46,380	175	< 1	12,670	27	31,007	67	2,528	5	0	0
Loamy/T[3]	5-9"	62	0	0	0	0	0	0	0	0	62	100
Shallow loamy	5-9"	8,465	0	0	4,015	47	3,621	43	829	10	0	0
Shallow clayey	5-9"	289	0	0	0	0	289	100	0	0	0	0
Gravelly	5-9"	14,423	0	0	6,467	45	6,966	48	990	7	0	0
Very Shallow	5-9"	10	0	0	10	100	0	0	0	0	0	0
Subtotal		169,606	175	< 1	38,029	22	121,802	72	9,538	6	62	< 1
Salt Desert Shrub												
Shale	5-9"	2,531	0	0	1,549	61	982	39	0	0	0	0
Shale	10-14"	4,198	0	0	888	21	3,072	73	238	6	0	0
Saline Upland	5-9"	257,374	4,123	2	190,250	74	56,516	22	6,400	2	85	< 1
Saline Upland/T[3]	5-9"	2,145	0	0	0	0	0	0	0	0	2145	100
Saline Upland	10-14"	51,118	2,574	5	30,378	59	14,986	29	3,180	6	0	0
Subtotal		317,366	6,697	2	223,065	70	75,556	24	9,818	3	2,230	1
Foothills-Mountain Grassland/Shrub												
Shallow Sandy	10-14"	57,422	0	0	18,151	32	27,678	48	11,593	20	0	0
Sandy	10-14"	41,697	0	0	10,764	26	18,939	45	11,994	29	0	0
Shallow Loamy	10-14"	141,589	0	0	69,749	49	56,379	40	15,461	11	0	0
Loamy	10-14"	102,992	0	0	38,315	37	59,548	58	5,129	5	0	0
Shallow Clayey	10-14"	6,388	0	0	1,713	27	2,490	39	2,185	34	0	0
Clayey	10-14"	3,564	0	0	119	3	2,780	78	665	19	0	0
Shallow Loamy	15-19"	70,218	0	0	8,632	12	50,858	73	10,728	15	0	0
Loamy	15-19"	14,235	0	0	4,891	34	9,344	66	0	0	0	0
Shallow Clayey	15-19"	4,336	0	0	869	20	3,467	80	0	0	0	0
Clayey	15-19"	1,082	0	0	425	39	657	61	0	0	0	0
Subtotal			443,523	0	0	153,628	35	232,140	52	57,755	13	00

TABLE 12 (continued)
PLANT COMMUNITIES AND ECOLOGICAL CONDITION IN THE PLANNING AREA

Plant Community Range Site	Precipitation Zone	Total Acres	Ecological Condition Classes[1]									
			Potential Natural Community		Late Seral		Middle Seral		Early Seral		Not Classified[2]	
			Acres	Percentage	Acres	Percentage	Acres	Percentage	Acres	Percentage	Acres	Percentage
Salt Bottom												
Saline Lowland	5-9"	16,203	0	0	1,952	12	5,577	34	8,674	54	0	0
Saline Lowland/T[3]	5-9"	303	0	0	0	0	0	0	0	0	303	100
Saline Lowland	10-14"	15,406	0	0	279	2	13,737	89	1,390	9	0	0
Saline Subirrigated	5-9"	249	0	0	0	0	162	65	87	35	0	0
Sub Total		32,161	0	0	2,231	7	19,476	61	10,151	32	303	< 1
Riparian/Cottonwood												
Lowland	5-9"	1,568	0	0	0	0	104	7	1,464	93	0	0
Lowland	10-14"	2,396	0	0	56	2	2,123	89	217	9	0	0
Overflow	10-14"	312	0	0	0	0	312	100	0	0	0	0
Riparian	Varies	729	0	0	0	0	0	0	0	0	729	100
Reservoirs	Varies	945	0	0	0	0	0	0	0	0	945	100
Subtotal		5,950	0	0	56	1	2,539	43	1,681	28	1,674	28
Woodland/Forested												
Mixed Conifer/Deciduous												
Woodland	10-14"	199	0	0	0	0	0	0	0	0	199	100
Shallow Loamy/W[4]	10-14"	15	0	0	0	0	15	100	0	0	0	0
Shallow Sandy/W[4]	10-14"	185	0	0	0	0	185	100	0	0	0	0
Gravelly	10-14"	29,782	0	0	10,360	35	13,786	46	5,636	19	0	0
Very Shallow	10-14"	1,554	0	0	70	5	549	35	841	54	94	6
Woodland	15-19"	4,800	0	0	0	0	0	0	0	0	4,800	100
Shallow Loamy/W[4]	15-19"	95	0	0	0	0	95	100	0	0	0	0
Shallow Sandy/W[4]	15-19"	3,171	0	0	71	2	3,100	98	0	0	0	0
Very Shallow	15-19"	2,432	0	0	27	1	2,167	89	238	10	0	0
Forested	15-19"	17,387	0	0	0	0	0	0	0	0	17,387	100
Subtotal		59,620	0	0	10,528	18	19,897	33	6,715	11	22,480	38

TABLE 12 (continued)
PLANT COMMUNITIES AND ECOLOGICAL CONDITION IN THE PLANNING AREA

Plant Community Range Site	Precipitation Zone	Total Acres	Ecological Condition Classes[1]									
			Potential Natural Community		Late Seral		Middle Seral		Early Seral		Not Classified[2]	
			Acres	Percentage	Acres	Percentage	Acres	Percentage	Acres	Percentage	Acres	Percentage
Barren/Alpine/Not Inventoried												
Disturbed		3,185	0	0	0	0	0	0	0	0	3,185	100
Rock Outcrop		194,487	0	0	0	0	0	0	0	0	194,487	100
Not Inventoried		56,972	0	0	0	0	0	0	0	0	56,972	100
Subtotal		254,644	0	0	0	0	0	0	0	0	254,644	100
Planning Area Totals		1,282,870	6,872	1	427,537	33	471,410	37	95,658	7	281,393	22

NOTE: Table includes all surface acreage where public and private surface are managed in common.

[1] Ecological Condition Class also referred to as Seral Stage. Formerly referred to as Excellent (Potential Natural Community), Good (Late Seral), Fair (Middle Seral), Poor (Early Seral).

[2] Includes various range sites in which no site description exists or site was not inventoried.

[3] /T = Includes range sites which were contour furrowed and seeded.

[4] /W = Includes range sites which have substantial woodland plant composition.

Wild Horses

In the planning area wild and free roaming horses are found in the Fifteenmile Wild Horse Herd Management Area. The herd area is about 83,130 acres. About 2,300 AUMs of forage could be consumed by wild horses in a given year, while domestic livestock use averages about 1,280 AUMs in the herd area. (All of the domestic livestock are sheep.) Legally authorized livestock use is much higher than the level of actual use: The total authorized livestock grazing use in the herd area is 7,925 AUMs. Of this amount, 6,280 AUMs represent authorized use that could take place on public lands (active preference). In contrast to the authorized and average use levels, the overall recommended stocking level for livestock and wild horses in the herd area is about 5,670 AUMs, based on rangeland vegetation inventory data.

After passage of the Taylor Grazing Act, the first recorded wild horse roundup took place in October, 1938 on a large area identified as "Federal Range in the area south of the Greybull River to Cottonwood Creek." (Worland District Office files).

With the passage of the Wild Horse and Burro Act of 1971, a portion of the natural range was established as the herd management area. Sometimes horses roam outside the established area. Depending on the time of the year, as many as 80 wild horses can be found outside the herd area on adjacent grazing allotments. These grazing allotments, with all or most of their lands outside the herd area, are: 0612 (South Tatman), 0639 (Tatman Mountain Common), and 0640 (Snyder). Grazing allotments that are within, or partly within, the herd area boundary are: 0604 (Dickie), 0652 (Badger Basin), 0676 (Pitchfork), 0669 (Allen Basin), 0682 (Hunt Oil Company), and 0640 (Snyder).

As of October 1991, there were about 158 horses in the herd management area. Each horse requires about 900 pounds of forage per month. Currently, the herd appears to be in good condition, although range conditions are generally rated as static or downward in trend.

Table 13 shows vegetative condition by range site for grazing allotments in the Fifteenmile Wild Horse Herd Management Area.

The herd area is located in the Fifteenmile Creek watershed which is characterized by badland topography and high levels of erosion. Precipitation ranges from 4 to 12 inches per year, with an average of 7.8 inches per year.

Fifteenmile Creek is a cottonwood-lined ephemeral stream, although a few seeps are located along the creek where water may be present for extended periods of time. Generally water is a major concern in the herd area because of the low precipitation and high siltation levels, and the possibility of drought. There are eight reliable reservoirs in the area. Twenty-five additional reservoirs hold water during part of the year. (The number of reservoirs holding water depends on the annual precipitation.) The water quality is poor because of silt levels and many of the reservoirs are not suitable for horses, wildlife, or livestock. Two water wells in or near the horse herd management area are currently not producing. The completion of additional wells in the herd management area is questionable because of the formation depths and characteristics. (Worland District Hydrologic Feasibility Study, September 1991.)

The fences between the herd area and the Snyder and the Tatman Mountain Common allotments are in good condition; however, horses routinely break portions of these fences along historically-used trails. The most recent roundup, conducted in October 1991, reflected this problem because 40 horses were gathered from these two allotments. Within five months 45 horses were again on these allotments.

The fence between the herd area and the South Tatman Allotment is in very poor condition and the horses have been using this allotment for some time. It is common to find 30 to 40 horses grazing on this allotment.

In addition to concerns about water and fences, the mixture of private and public lands in the herd area is a problem. Land exchanges to acquire privately-owned lands for public lands elsewhere, have been discussed as a possible solution.

Wildlife and Fish

Lists of the fish, wildlife species, and raptors are available upon request from the Grass Creek Resource Area office.

Wildlife

Mammals

Big Game. Public lands in the planning area provide a large portion of the habitat needed for big game animals. Table 14 shows the population levels and the number of acres in crucial winter range or birthing areas. The availability of habitats is often the limiting factor for growth of big game populations. Pronghorn antelope and mule deer are also heavy users of the public lands throughout the year.

TABLE 13
PLANT COMMUNITIES AND ECOLOGICAL CONDITION
IN THE FIFTEENMILE WILD HORSE HERD MANAGEMENT AREA

Plant Community Range Site	Precipitation Zone	Total Acres	Ecological Condition Classes[1]									
			Potential Natural Community		Late Seral		Middle Seral		Early Seral		Not Classified[2]	
			Acres	Percentage	Acres	Percentage	Acres	Percentage	Acres	Percentage	Acres	Percentage
Basin Grassland/Shrub (high and low density sagebrush)												
Sandy	5" to 9"	4,943	0	0	1,776	36	2,962	60	205	4	0	0
Shallow sandy	5" to 9"	2,737	0	0	921	34	1,535	56	281	10	0	0
Loamy	5" to 9"	4,696	0	0	2,686	57	1,922	41	88	2	0	0
Shallow loamy	5" to 9"	2,273	0	0	1,781	78	449	20	43	2	0	0
Subtotal		14,649	0	0	7,164	49	6,868	47	617	4	0	0
Salt Desert Shrub												
Shale	5" to 9"	1,997	0	0	1,549	78	448	22	0	0	0	0
Saline Upland	5" to 9"	30,300	1,743	6	18,679	62	9,258	31	535	2	85	< 1
Saline Upland/T[3]	5" to 9"	885	0	0	0	0	0	0	0	0	885	100
Gravelly	5" to 9"	1,566	0	0	733	47	591	38	242	15	0	0
Saline Upland	10" to 14"	5,123	60	1	3,630	71	179	3	1,254	24	0	0
Subtotal		39,871	1,803	5	24,591	62	10,476	26	2,031	5	970	2
Foothills-Mountain Grassland/Shrub												
Shallow Sandy	10" to 14"	19	0	0	0	0	19	100	0	0	0	0
Shallow Loamy	10" to 14"	7	0	0	5	71	2	29	0	0	0	0
Loamy	10" to 14"	148	0	0	0	0	148	100	0	0	0	0
Shallow Clayey	10" to 14"	1,432	0	0	0	0	6	< 1	1,426	99	0	0
Clayey	10" to 14"	1,151	0	0	0	0	381	33	770	67	0	0
Subtotal		2,757	0	0	5	< 1	556	20	2,196	80	0	0
Salt Bottom												
Saline Lowland	5" to 9"	3,472	0	0	18	< 1	2,162	62	1,292	37	0	0
Saline Lowland	10" to 14"	95	0	0	0	0	95	100	0	0	0	0
Subtotal		3,567	0	0	18	< 1	2,257	63	1,292	36	0	0

TABLE 13 (continued)
PLANT COMMUNITIES AND ECOLOGICAL CONDITION
IN THE FIFTEENMILE WILD HORSE HERD MANAGEMENT AREA

Plant Community Range Site	Precipitation Zone	Total Acres	Ecological Condition Classes[1]									
			Potential Natural Community		Late Seral		Middle Seral		Early Seral		Not Classified[2]	
			Acres	Percentage	Acres	Percentage	Acres	Percentage	Acres	Percentage	Acres	Percentage
Riparian/Cottonwood												
Lowland	5" to 9"	104	0	0	0	0	104	100	0	0	0	0
Subtotal		104	0	0	0	0	104	100	0	0	0	0
Barren/Alpine/Not Inventoried												
Disturbed		119	0	0	0	0	0	0	0	0	119	100
Rock outcrop		21,417			0	0	0	0	0	0	21,417	100
Not Inventoried		0	0	0	0	0	0	0	0	0	0	
Subtotal		21,536	0	0	0	0	0	0	0	0	21,536	100
Horse Herd Area Totals		82,484	1,803	2	31,778	39	20,261	25	6,136	7	22,506	27

NOTE: Table includes all surface acreage where public and private surface are managed in common.

[1] Ecological Condition Class also referred to as Seral Stage. Formerly referred to as Excellent (Potential Natural Community), Good (Late Seral), Fair (Middle Seral), Poor (Early Seral).

[2] Includes various range sites in which no site description exists or site was not inventoried.

[3] /T = Includes range sites which were contour furrowed and seeded.

[4] /W = Includes range sites which have substantial woodland plant composition.

TABLE 14
BIG GAME POPULATIONS ON CRUCIAL WINTER RANGE AND BIRTHING RANGE, 1990

Species	Estimated Population in Planning Area	Crucial Winter Range		Birthing Range		Population Trend
		Total Acres	Percent Public	Total Acres	Percent Public	
Bighorn Sheep[1]	20-30	270	30			slowly increasing
Elk	1,000-1,500	81,800	33	46,000	35	stable
Moose	50	16,800	28	9,100	25	slowly increasing
Mule Deer[1]	12,000-13,000	396,500	55			stable to slowly increasing
White-tailed Deer[2]	—	—	—	—	—	slowly increasing
Pronghorn Antelope	5,000-6,000	128,600	69	4,697	100	increasing

[1]Birthing areas were not identified for mule deer and bighorn sheep in 1990. (WGFD, 1990)

[2]Neither birthing nor crucial winter ranges were identified for white-tailed deer. (WGFD 1990)

Bighorn Sheep. Currently, 20 to 30 bighorn sheep use an estimated 11,800 acres of high elevation land in the western portion of the planning area. The population moves back and forth between the Wind River Indian Reservation, the Shoshone National Forest, and a few square miles in the southwestern corner of the planning area (Map 31). In the planning area their current range is restricted to the upper portions of the South Fork of Owl Creek and Rock Creek. An interagency research proposal is focusing on population dynamics, seasonal movements, and habitat use to aid in future habitat improvements and expansions. Previously used habitat at Mudstone Ridge, Castle Rocks, and the Holy City is being studied to evaluate the potential for bighorn sheep reintroduction.

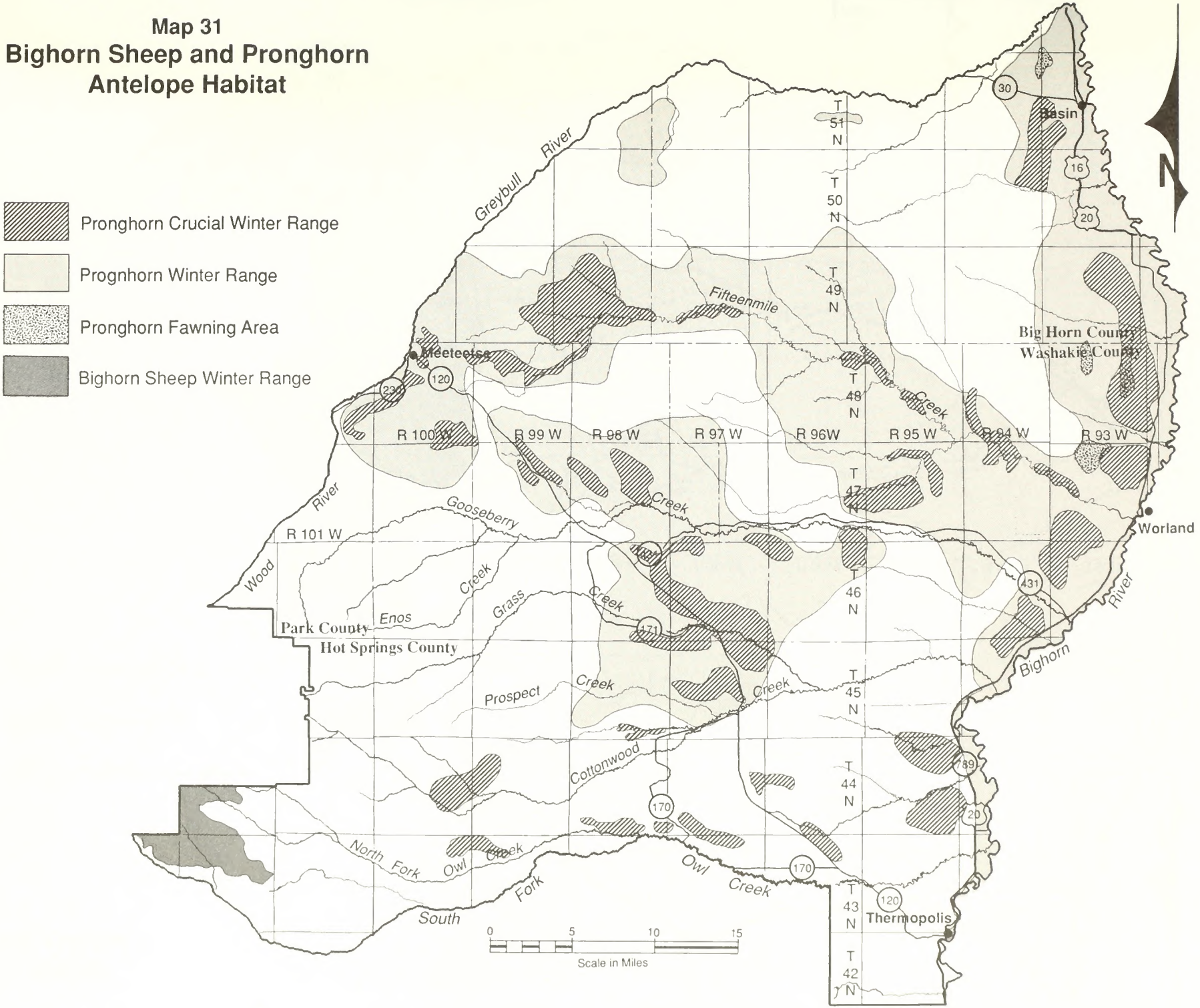
Elk. The elk habitat in the planning area consists of about 216,000 acres public, state, and private lands which include about 81,800 acres of crucial winter range (Map 32). The habitat supports an estimated population of 1,000 to 1,500 animals. Elk are the major migratory big game animals inhabiting the higher elevations in the western part of the planning area. Elk migrate, winter, and calve along a series of ridges separating the upper reaches of the Owl Creek, Cottonwood Creek, Grass Creek, Enos Creek, and Gooseberry Creek drainages. These ridges are characterized by dense stands of timber along their northern exposures. Hiding and thermal cover is best on these exposures. Sparse timber and sagebrush-grassland slopes and openings characterize the southern exposures. These are open and wind-swept in the winter and are often the best forage sites. The ridgetops are used as migration corridors and wintering habitat. Some elk remain in the planning area yearlong.

Moose. It is estimated that there are 50 moose in the planning area on about 107,000 acres. (See Map 33.) These moose inhabit the headwaters of streams on the eastern slope of the Absaroka Mountains. Wintering moose tend to concentrate along stream bottoms and riparian areas where tender woody plants are browsed and in thick coniferous timber where snow depths are decreased. Shrubs are important forage yearlong.

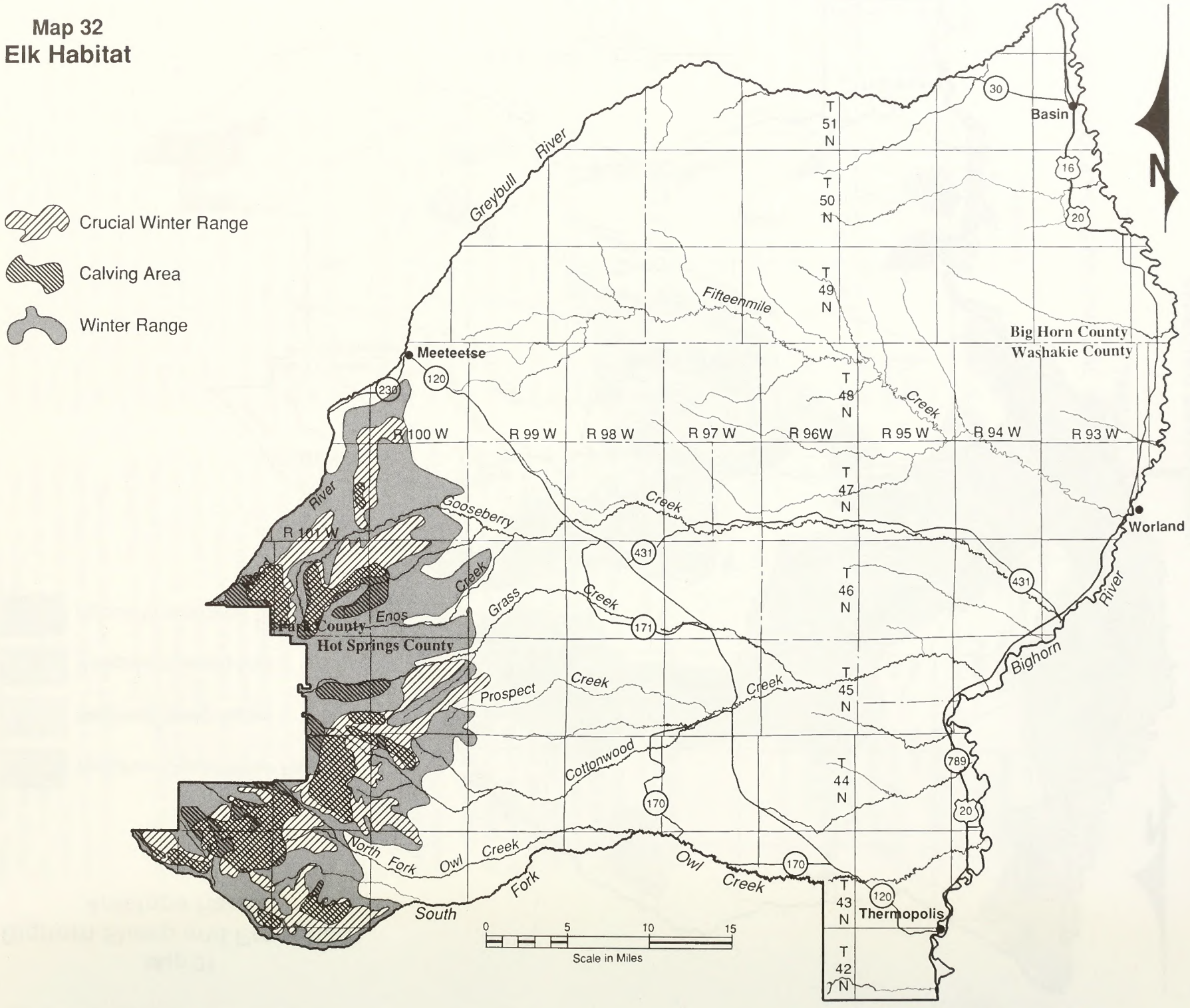
Mule Deer and White-Tailed Deer. Mule deer have an estimated population of 12,000 to 13,000 animals in the planning area. Mule deer habitat is an estimated 1,453,300 acres of public, state, and private lands, of which about 396,500 acres are crucial winter range (Map 34). It is assumed that at least 50 percent of the mule deer are yearlong residents of the badlands and river bottoms. The remainder of the herds winter in the planning area and migrate to and from the Shoshone National Forest in the spring and fall. The migrant herds winter primarily in foothills below 7,500 feet. These are characterized by scattered juniper and limber pine, rocky topography, and sagebrush slopes and draws. The most important winter forage plants are Wyoming big sagebrush and other shrubs.

The migrant mule deer that use the higher elevations have slowly been recovering from a major population decline during the late 1970s. In the lower elevations resident deer in small herds use river bottoms, small streams, and badlands. The greatest diversity of important browse plants are along rivers and streams. These resident herds have remained stable or increased slightly.

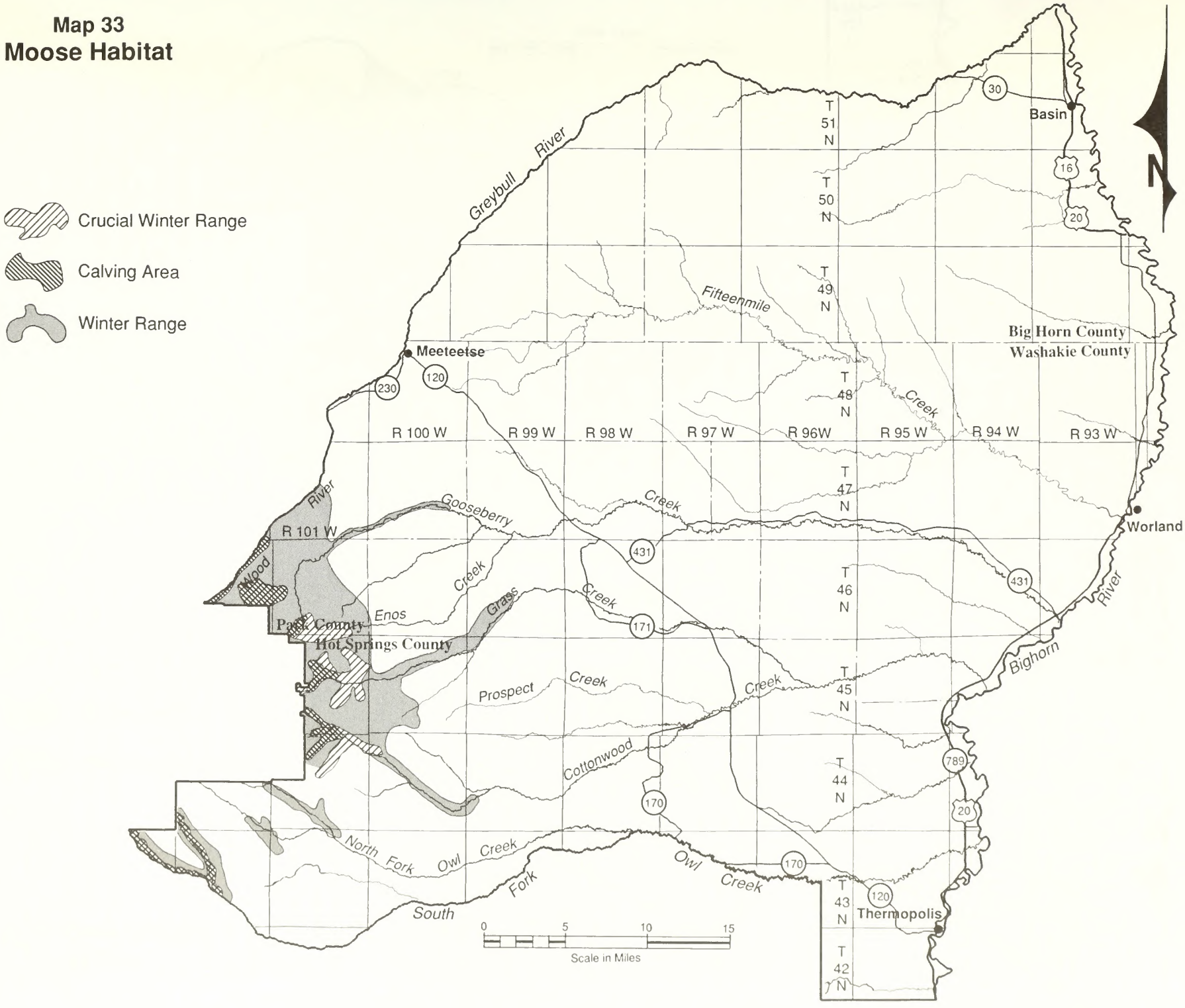
Map 31
Bighorn Sheep and Pronghorn Antelope Habitat



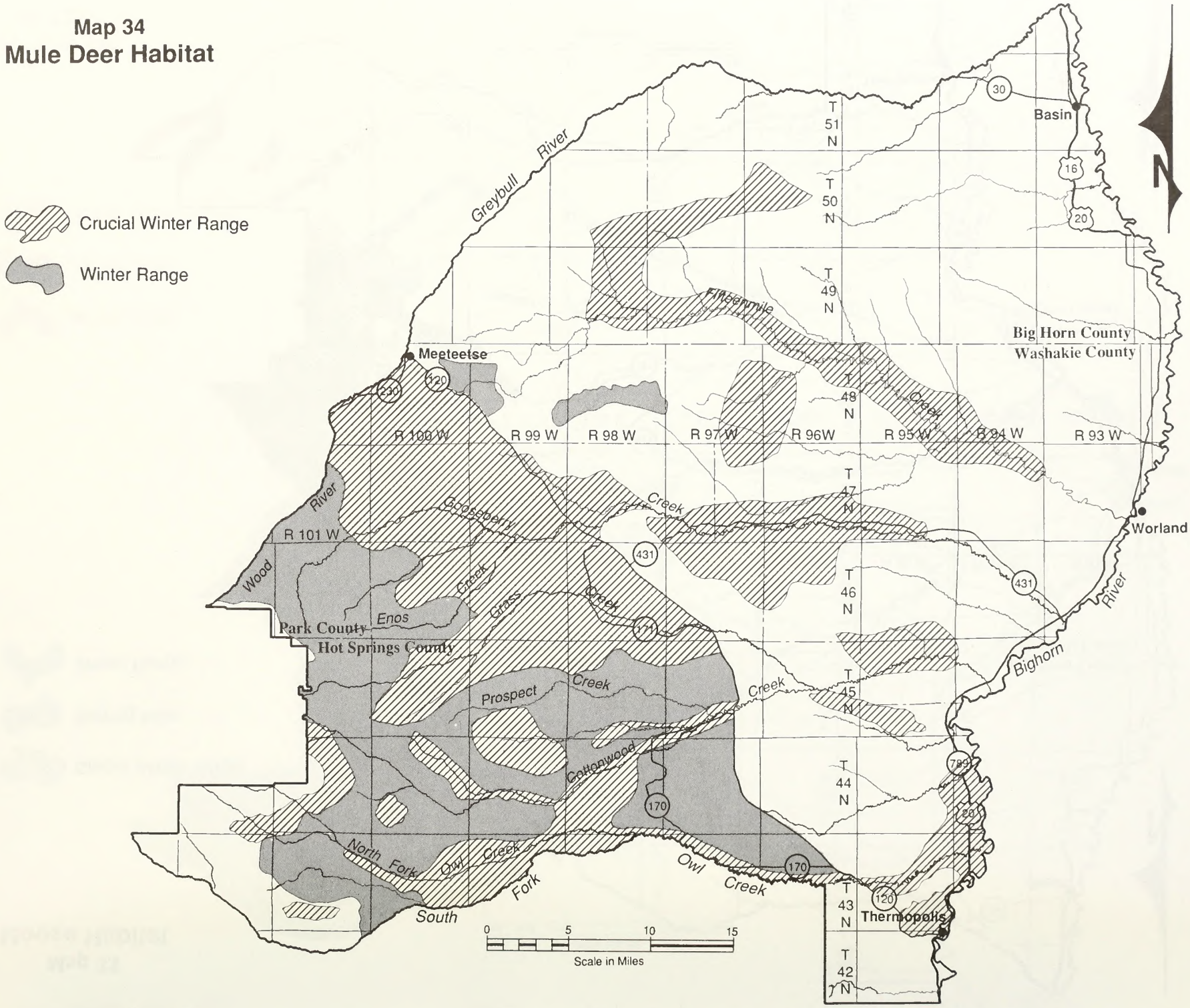
Map 32
Elk Habitat



Map 33
Moose Habitat



Map 34
Mule Deer Habitat



White-tailed deer inhabit an estimated 77,000 acres of habitat in the planning area. This habitat is generally associated with wooded and agricultural lands along river bottoms and riparian areas of the Bighorn, Wood, and Greybull rivers; and their perennial tributaries such as Owl, Cottonwood, Gooseberry, and Fifteenmile creeks. The majority of this habitat is privately-owned, however, several public land tracts along the rivers provide good yearlong habitat.

Pronghorn Antelope. Pronghorn antelope habitat in the planning area consists of an estimated 1,327,000 acres of winter or yearlong habitat which includes 128,600 acres of crucial winter range (refer to Map 31). This habitat supports a population of 5,000 to 6,000 animals. Pronghorn have been observed from alpine tundra in the southwestern corner of the planning area to the salt desert lowlands. Definite migratory patterns exist between winter ranges and spring/summer ranges. Across these migratory routes and near fawning areas, a few old fences form barriers to the passage of pronghorns. Crucial winter ranges are in basins at elevations from 4,000 to 6,000 feet and along benchlands where Wyoming big sagebrush dominates and snow depths are consistently shallow. Fawning areas are usually located near winter ranges. Browse is the most important kind of forage, but grasses and forbs are also important in spring and summer.

Predators and Furbearers. Black bear and mountain lion are trophy game animals that are harvested through sport hunting in the planning area. The WGFD classifies coyote, jackrabbit, porcupine, raccoon, red fox, and skunks as predacious animals that can be harvested for predator control without a hunting license.

Beaver, badger, bobcat, muskrat, mink, and pine marten are classified as furbearers and are fairly abundant in the planning area. Predaceous animals and furbearers use a variety of plant communities, from lowland riparian and agricultural communities to conifer forests.

Small Mammals. Small mammals inhabiting the planning area include cottontail rabbits, snowshoe hares, white-tailed prairie dogs, bushy-tailed woodrats, deer mice, chipmunks, weasels, kangaroo rats, sagebrush voles, various squirrels including the thirteen-lined ground squirrel, pocket gophers, marmots, other small rodents, pikas, bats, and shrews. These animals are important food for reptiles, raptors, and other mammals. Cottontail rabbits and snowshoe hares can be harvested as small game animals.

Birds

Neotropical Migrant Birds

The planning area provides nesting habitat for around 100 species of neotropical migrant birds. The populations of most of these species are declining in part due to habitat fragmentation on breeding grounds in the planning area. Some examples of these species are sparrows, warblers, flycatchers, and swallows.

Raptors

Twenty-one species of raptors inhabit the planning area for some parts of the year. Golden eagles and rough-legged hawks concentrate in the eastern portion of the planning area during the winter.

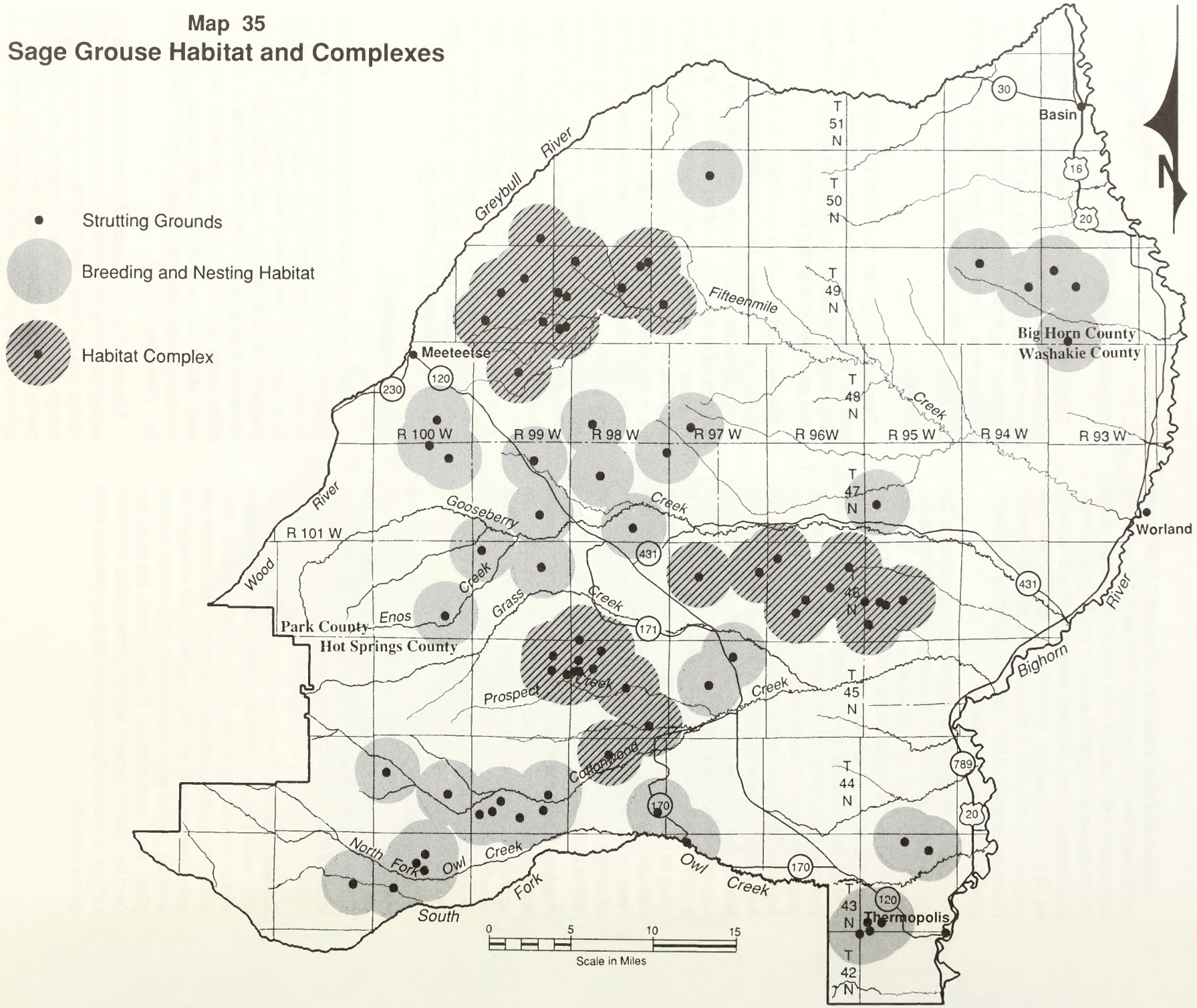
Eleven kinds of raptors are known to breed in the planning area. Raptors, like most birds, are very sensitive to disturbance during the nesting period and are likely to abandon their nesting attempts if they are disturbed during nest building or when eggs are being laid. Raptors will tolerate some intrusion when young are in the nest. Some raptor pairs nest in the same vicinity year after year. Cliffs, rock outcrops, and sometimes shrubs or cottonwood trees are used for nesting sites by most raptors. In open country, utility poles, fence posts, isolated trees, rock outcrops, and other structures provide important hunting perches for raptors. These are often along transportation routes where raptors can be hit by automobiles while feeding on roadkills. Raptor electrocution may still be a problem on some of the older power lines but most have been upgraded to raptor-proof standards.

Upland Game Birds

There have been about 100 sage grouse leks (strutting grounds) identified in the planning area over the past 30 years. Leks are clearings in sagebrush where the birds can strut and breed with minimal threat from predators. In some sage grouse habitat areas, strutting takes place at various locations from year to year. In other areas, strutting occurs in the same place each year. Within ten days after breeding, females disperse to nesting areas which are usually within 2 miles of the lek. (See Map 35.)

Sagebrush is vital to sage grouse as food and cover, especially during the winter and nesting periods. During spring and summer, dependable water and succulent forage, like that found in wet meadows, are very important to hens with young broods. In addition, young birds rely almost exclusively on insects for food during the first six to eight weeks of life.

Map 35
Sage Grouse Habitat and Complexes



Other upland game birds in the planning area, include chukar and Hungarian partridge, ring-necked pheasant, blue and ruffed grouse, and mourning doves.

Populations of many upland game birds were higher during the 1970s. A hard winter is thought to have been responsible for the decline.

Waterfowl and Waterbirds

Habitat for ducks and geese is found along the Bighorn and Greybull rivers, and associated with perennial streams, stock ponds, and reservoirs. The Bighorn River provides the most important waterfowl habitat such as nesting habitat for Canada geese and for a variety of ducks. The Grass Creek Reservoir Habitat Management Plan (BLM 1983) is improving reservoirs for both production and fall staging habitat through fencing, planting of vegetation, and nest structure placement.

Five great blue heron rookeries have been identified in the planning area. One rookery is located on public land at Wardel Reservoir which uses a human-made structure built specifically for heron nesting.

Sandhill cranes and a variety of shorebirds are dependant on reservoirs, streams, and rivers for foraging and nesting habitats.

Reptiles, Amphibians, and Insects

Several kinds of reptiles and amphibians inhabit riparian areas around streams, rivers, small temporary ponds, and reservoirs. Grasshoppers and mormon crickets occasionally have large population increases which can reduce annual growth of vegetation in some areas. The Animal and Plant Health Inspection Service (APHIS) controls these populations when necessary.

Fish

The "Wyoming Stream Fishery Classification Map," (WGFD 1987) shows about 470 miles of perennial trout streams in the planning area. About 1.3 miles of Class 1 streams on public land in the planning area are in good or excellent fisheries habitat condition. About 90.6 miles are Class 3 and 4 streams. (There are no Class 2 streams in the planning area). Of the Class 3 and 4 streams, 2.0 miles are in good or excellent condition, 35.9 miles are in fair condition, 10.7 miles are in poor condition, and 42.0 miles are in undetermined condition.

Twenty-eight miles of Class 1, 3, and 4 streams in the planning area contain trout populations or habitat with the potential to support trout. Most perennial streams contain a variety of native nongame fish species such as longnose dace, flathead chub, lake chub, plains killifish, silvery minnow, and fathead minnow. Nongame species provide biodiversity, forage for sport fish, a prey base for numerous birds and mammals, and are often seined for bait by fishermen or commercial bait dealers. In the planning area, 61.18 miles of streams contain fish.

Good or excellent fisheries habitat is found in the deep canyon portion of Owl Creek and along the upper portions of the Bighorn River. Habitat condition in most other streams is fair or poor. Fisheries habitat condition depends on flow, channel stability, riparian and watershed condition. About 70 percent of all perennial streams on public land are in a stable or upward trend, about 30 percent are in a declining trend.

Two reservoirs on public lands in the planning area contain fish. Wardel Reservoir has been stocked several times with trout and walleye, but subsequent irrigation demands almost emptied the reservoir and destroyed most of the fish. It has recovered somewhat and is now producing walleye and yellow perch but not trout. The WGFD is planning to restock Wardel Reservoir as stockable fish become available. Crappie were stocked in 1992.

A reservoir commonly known as Wardel East (Albert Wardel #1) is 2 miles southeast of Wardel Reservoir. A fish survey conducted in 1992 revealed that the reservoir contained a variety of nongame fish and some walleye. These fish probably entered the reservoir through a ditch from Wardel Reservoir. Wardel East was constructed by an irrigator specifically for irrigation and is too shallow to support fish during normal winters. The WGFD will not pursue a stocking program for Wardel East.

Immediately upstream of Wardel Reservoir, irrigators are constructing Harrington Reservoir under a right-of-way grant from the BLM. The primary purpose is the retention and management of irrigation water from the Greybull River. As a new reservoir on public land, requirements would be placed on its operation to mitigate impacts on wildlife.

Shallow waters will occupy much of the reservoir; however, the reservoir will be deep enough to maintain a minimum water depth of 12 feet at the deepest part. This should insure survival of fish populations while allowing drawdowns to meet irrigation demands. It is anticipated that the WGFD will stock the new reservoir as soon as practical after the reservoir fills. Since water temperature will often be warm in shallow parts of the reservoir, the most practical fish for stocking would be walleye, yellow perch, crappie, bass, and bullheads. It is assumed that minnows and suckers will also colonize the reservoir through the ditch system from the Greybull River.

Threatened, Endangered, and Candidate Wildlife Species

Threatened or Endangered Wildlife Species

Bald Eagle. The most common federally-listed endangered species known to inhabit the planning area is the bald eagle. An average of 55 bald eagles winter along Owl Creek and the Wood, Greybull, and Bighorn rivers. Roosting, perching, and potential nesting sites occur in cottonwoods and conifers along these rivers. Food sources include fish, waterfowl, and carrion. Occasionally bald eagles have been sighted during the spring and summer. One nest was discovered in 1979 near Basin, but has not been used since 1988.

Black-Footed Ferret. The last known wild population of black-footed ferrets was near the northwestern border of the planning area. One of the main habitat requirements of black-footed ferrets is the abundance of food, commonly consisting of prairie dogs. White-tailed prairie dogs can be found in areas that contain salt desert shrub or basin grassland/shrub vegetative communities. In the planning area, white-tailed prairie dog towns are from 1 to 1,000 acres. The larger colonies, between the South Fork of Fifteenmile Creek and Hillberry Rim, and east of Hamilton Dome, could be possible habitat for black-footed ferrets.

Grizzly Bear. The threatened grizzly bear is occasionally seen on the western edge of the planning area. Occupied habitat, identified in a recovery plan, is less than 20 miles west of the planning area. Grizzly bears have been observed twice since 1978 in the Absaroka Mountain foothills.

The planning area is within Management Situation 5 lands, described as areas where grizzlies do not occur or occur only rarely. Situation 5 habitat may be unsuitable, unavailable, or suitable and available but unoccupied. It is generally believed that major federal activities or programs would not affect grizzly conservation and recovery on these lands. Additionally, maintenance of grizzly bear habitat is considered an option in Situation 5 areas. Grizzly bears involved in contact with humans would be controlled.

Historically, contacts between grizzlies and humans have occurred in adjacent areas during the spring, or related to garbage dumps and hunting camps at other times. With recovery of grizzly bear populations in the Greater Yellowstone Ecosystem and subsequent filling of open bear habitat, the potential for bear/human conflicts is likely to increase.

Studies of the effects of roads on grizzly bears generally have shown that bears are displaced by motor vehicles. Significantly less use of habitat occurs within 750 feet of roads. Riparian areas are important to grizzly bears in the spring. Potential habitat for transient bears would be provided by streams in the higher elevations of the Absaroka foothills in the planning area.

Northern Rocky Mountain Gray Wolf. During the past few years, evidence supporting the presence of the Northern Rocky Mountain Grey Wolf in the planning area has been reported. Large wild canine sightings, tracks, scat, and howls indicate that the wolf may frequent the western quarter of the planning area. Wolves most likely would be present around concentrations of big game and away from people. Potential habitat in the planning area would be found along portions of Gooseberry, Grass, Cottonwood, and Owl creeks. A recovery plan for wolves in the Rocky Mountains has been written for lands immediately west of the planning area.

Peregrine Falcon. Peregrine falcons have been seen migrating through the planning area; however, no nesting has been documented. Potential nesting habitat includes cliffs near prey (such as waterfowl or pigeons) and close to surface water. The South Fork of Owl Creek, the Holy City, and Castle Rocks are marginal habitat.

Candidate Wildlife Species

There are nine species of birds and four of mammals in the planning area listed as Category 2C (see Glossary). The ferruginous hawk, mountain plover, long-billed curlew, and thirteen-lined ground squirrel might be found in basin grassland/shrub and salt desert shrub communities. The prey base for these animals varies from small mammals (ferruginous hawk) and small birds, lizards, snakes, seeds and grasses (thirteen-lined ground squirrel) to insects, crustaceans, and seeds (long-billed curlew and mountain plover). In the woodland community, the loggerhead shrike consumes insects, small vertebrates, and carrion. In the high elevations, the wolverine, lynx, and goshawk live in the mixed conifer/deciduous communities. All of these animals feed on small mammals and birds. The wolverine will feed on big game and berries and the goshawk will include birds in its diet. The lakes, rivers and wetlands may be habitat for the trumpeter swan, the white-faced ibis, the harlequin duck, the black tern, and the spotted bat who mainly feed on aquatic invertebrates and insects.

PROPOSED AREAS OF CRITICAL ENVIRONMENTAL CONCERN

Fifteenmile Watershed Proposed ACEC

The Fifteenmile Creek watershed drains about 274,300 acres of public lands characterized by badlands and desert. Within the watershed, Fifteenmile Creek flows for about 50 miles from its headwaters to the Bighorn River. The size, geology, and land uses of the watershed cause Fifteenmile Creek to be the largest contributor of sediment to the Bighorn River (state of Wyoming, 1979). In places, the channel is deeply incised, causing tributaries to cut gullies and erode riparian areas. Starting in the 1950s, water control structures were built to reduce erosion and sediment transfer within the watershed. Most of these structures are no longer serving their original purposes and despite advances in grazing management sediment delivery to the Bighorn River continues to be a major concern.

Land use management in the Fifteenmile Creek watershed should address the overall health of riparian and upland areas. These need to function properly to stabilize the watershed. Management actions should consider how the resources and land uses of the watershed are interrelated. As a desert ecosystem, the watershed is important because of its size and sediment production, but in other ways is similar to desert watersheds throughout the planning area. Land uses within the watershed include grazing by livestock and wild horses, use of habitat by wildlife, hunting, sightseeing, and ORV travel. The variety of land uses and problems will require individuals, organizations, and the BLM to respond in a cooperative way.

The watershed is relevant and important for special management because (1) its hydrologic processes are not properly functioning; (2) it contains a Cottonwood ecosystem, providing biological diversity and necessary wildlife habitat; (3) sediment from the watershed has adversely affected municipal water supplies, scenic quality, and recreational opportunities of the Bighorn River; and (4) management solutions must be based on cooperation.

Broad management and resource condition objectives for the watershed are: reducing upland soil erosion and sediment delivery to the Bighorn River, restoring riparian areas on public lands to a properly functioning condition, and improving overall production of vegetation.

Meeteetse Draw Rock Art Proposed ACEC

In the proposed ACEC, comprising about 6,800 acres of public land, a type of cultural site is represented that typically has traditional cultural importance to Native Americans. Thirteen of these sites have been located. The Shoshone and Crow tribes have identified the area around Thermopolis, Wyoming as being likely to have sites of traditional cultural value and spiritual significance. The Crow say that one of the four lodgepoles that mark the boundaries of their territory was positioned at the Hot Springs in Thermopolis.

At least eleven petroglyphs in the Meeteetse Draw area are thought to represent shaman figures, related to the religious practices of medicine men. The figures are often well formed and have elements which indicate the spiritual nature of the people. The figures include realistic and abstract representations of humans, animals, and celestial objects.

Two stone circle sites, having traditional cultural value to the tribes, are known to exist in the Meeteetse Draw area. It is possible that these sites are the remains of sweat lodges or other structures of ritual importance.

Six sites have been evaluated for listing on the National Register of Historic Places and five of these have been determined to be eligible for listing. Seven sites that have not been formally evaluated are managed as significant sites.

Study of Meeteetse Draw Petroglyph Area can further an understanding of aboriginal life in the Northwest Plains. The rock art and associated sites allow a glimpse of the rituals and the past of these people.

Many of the known sites have traditional cultural and sacred values to Native Americans who may currently be using these sites for religious ceremonies. Controlled management of this area would ensure Native American access to these sites in conformance with federal policy stated in the American Indian Religious Freedom Act.

At least three universities have studied several of the sites. These include the universities of Wyoming and North Dakota and the Arizona State University. The physical characteristics of petroglyphs make this area one of the few where the new analytical techniques for radiocarbon dating can be successfully used.

Upper Owl Creek Area

The upper Owl Creek area is 45 miles west-northwest of Thermopolis and covers about 17,100 acres in the Absaroka Mountain foothills. The Washakie Wilderness area of the Shoshone National Forest is immediately to the west. The Wind River Reservation borders part of the area on the south.

The upper Owl Creek area is in a natural setting because of its relative lack of vehicle access and development. Elevations range from 7,220 to 11,320 feet above sea level. Slopes vary from 6 degrees on high benches, to greater than 60 degrees along rocky escarpments bordering windswept ridges. The soils are shallow, producing sparse, tundra-like vegetation in exposed areas. These shallow soils and steep slopes contribute to high landslide potential.

The precipitation ranges from 15 to 19 inches; the heaviest accumulations occur as snow during the winter with frequent and sudden thunderstorms throughout the summer. Flash floods are common. Sagebrush grasslands and riparian vegetation characterize the benches and streambottoms, subalpine forests occupy north-facing slopes, and dry, alpine tundra or barren areas typify the ridge-tops.

Endemic sensitive plants grow in "moon-scapes" where rocky, sparely-vegetated soils support low-growing cushion plant communities. Sensitive species found in or adjacent to the proposed ACEC include sweet-flowered rock jasmine, Evert's wafer-parsnip, Wyoming tansymustard, Rocky Mountain twinpod, and shoshonea.

Recreation opportunities abound in this area for primitive activities like hiking, camping, and horseback riding. Relatively few people are encountered, enhancing the feeling of solitude. The highly scenic aspect (VRM II) of the area and beautiful vistas compliment the primitive setting. Other common recreational pursuits are wildlife viewing and hunting although these opportunities are somewhat limited by poor access.

The combination of inaccessibility, topography, and vegetation have made the area home to many species of animals. The ridges provide migration routes and wintering areas for elk, bighorn sheep, and mule deer, as well as habitat for many other animals dependent upon alpine and rocky outcrops. In this part of the Greater Yellowstone Ecosystem potential is high for the expansion of endangered species like gray wolves and grizzly bears.

Moose are found in many of the stream bottoms with other riparian-dependent species like beaver, mink, black bear, and several kinds of neotropical migrant birds. The forested areas include some structurally diverse old growth stands, providing thermal cover for wintering elk and moose, as well as habitat for pine marten and neotropical migrant birds.

Throughout this area, there are diverse cultural resources and areas important in Native American tradition.

The area also provides important fisheries habitat. Other lands uses include commercial forestry and livestock grazing.

CHAPTER 4

ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

The previous chapter described the physical, biological, and socioeconomic characteristics of the planning area as of 1990—the RMP EIS base year for analysis. This chapter looks at how these characteristics of the planning area might change during a 15-year analysis period (from 1991 through 2005). For each alternative, the anticipated changes are summarized in the following tables.

Table 15 (Assumptions for Analysis) contains information on land and resource uses, production levels, and other socioeconomic factors. Production levels are described for the year 1990 and compared to anticipated production at the end of calendar year 2005. In addition to describing uses and production, Table 15 includes basic assumptions for determining other consequences of the alternatives.

Table 16 describes the consequences of the alternatives on biological, physical, and socioeconomic factors based on the assumptions contained in Table 15. The narrative portion of this chapter describes the same information in more detail.

PREFERRED ALTERNATIVE

Effects on Land Uses and Resources

Air

The emission of particulate matter into the air from wild and prescribed fires would directly affect air quality on a temporary and local basis. Annual emissions of particulate matter would measure about 1 to 4 tons under the Preferred Alternative. Short duration indirect effects to air quality and visibility would result if high winds produce dust storms in recently burned areas.

Other particulate emissions would result from surface-disturbing activities including fire control activities, off-road vehicle use, rights-of-way construction, mining, and gas and oil exploration and development.

Cultural, Paleontological, and Natural History Resources

The inventory and protection of cultural and paleontological resources would prevent unintentional damage to these resources from BLM-authorized activities. Generally, the effects would be beneficial. New information about these resources would be acquired through detailed inventories.

Many of these inventories would be funded by oil companies, utility companies, or by governmental agencies such as the Wyoming Department of Transportation or the Federal Highway Administration. Inventories would be conducted before the construction of roads, reservoirs, pipelines, power lines, fences, and well sites, and in response to proposed land sales and land treatments, such as the use of prescribed fire or aerial spraying.

The BLM would also grant permits for the scientific study of cultural and paleontological resources on public lands. These permits would ensure that important sites are protected and new scientific information is made available to the public.

During the past 15 years, about 27,900 acres were inventoried in the planning area for 534 projects. About 18,950 acres or 68 percent of the total, were inventoried in response to gas and oil and minerals-related activities; 3,540 acres (13 percent) were associated with lands and realty-related actions, such as power line and highway construction; 3,520 acres (12 percent) were associated with range and wildlife habitat improvement projects; and 1,890 acres (7 percent) were associated with forest management and recreational activities.

These inventories resulted in the discovery and evaluation of 1,017 cultural resource sites. Of these, 283 sites or 29 percent were considered eligible for listing on the National Historic Register. Comparing the anticipated level of future surface-disturbing activities to activities of the past 15 years, a similar number of eligible sites would be discovered during the analysis period.

Compared to other surface-disturbing activities, BLM has limited discretionary authority over activities conducted on mining claims, especially activities subject to a "notice." (See Glossary.) Two significant cultural resource sites would be lost during the analysis period as a result of mining claim activities subject to a "notice."

Native American spiritual values associated with rock art could be disturbed by bentonite exploration in the Frontier Formation (where sandstones often contain rock art). In the proposed Meeteetse Draw ACEC and near the Legend Rock Petroglyph Site, these adverse effects would be mitigated by closing lands to the staking of mining claims in the vicinity of the rock art.

TABLE 15
ASSUMPTIONS FOR ANALYSIS BY ALTERNATIVE

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
MISCELLANEOUS LAND USES	Protective measures would be applied as conditions of land and resource use: (a) to minimize soil movement; (b) to minimize disturbance of vegetation in sensitive areas such as riparian areas; (c) to protect important cultural and paleontological resources, recreational values, and wildlife resources; and (d) to protect visual quality.	Same as Preferred.	Same as Preferred.	Same as Preferred.
CULTURAL, PALEONTOLOGICAL, AND NATURAL HISTORY RESOURCES MANAGEMENT	About 30 percent of evaluated cultural resource sites would be found eligible for listing on the National Register of Historic Places.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	The average cultural resource site in the planning area would be about 40 acres.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Inventories conducted before surface-disturbing activities would identify between 280 and 350 important cultural resource sites.	Same as Preferred.	Same as Preferred.	Same as Preferred.
FIRE MANAGEMENT	About 600 acres of public land would be burned by wildfire during the analysis period.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Prescribed fire would be used on about 9,000 acres during the analysis period as a method of managing vegetation.	Prescribed fire would be used on about 4,500 acres during the analysis period as a method of managing vegetation.	Same as Preferred.	Same as Alternative A.

TABLE 15
ASSUMPTIONS FOR ANALYSIS BY ALTERNATIVE

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
FORESTLAND MANAGEMENT ***(also see Vegetation Management)***	During the 1990 base year for analysis, the timber harvest level on public land was 300 thousand board feet of sawlogs, 50 thousand board feet of posts and poles, and 50 thousand board feet of firewood.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	During the 1990 base year for analysis, the timber harvest level on lands not administered by BLM was 500 thousand board feet of sawlogs, 150 thousand board feet of posts and poles, and 50 thousand board feet of firewood.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	About 6 million board feet of forest products would be harvested from public land during the analysis period. These would comprise 4.5 million board feet of sawlogs, 750 thousand board feet of posts and poles and 750 thousand board feet of firewood.	Same as Preferred.	About 10 million board feet of forest products would be harvested from public land during the analysis period. These would comprise 8.5 million board feet of sawlogs, 750 thousand board feet of posts and poles and 750 thousand board feet of firewood.	About 4 million board feet of forest products would be harvested from public land during the analysis period. These would comprise 2.5 million board feet of sawlogs, 750 thousand board feet of posts and poles and 750 thousand board feet of firewood.
	Annual harvest levels on public land would remain constant during the analysis period at the 1990 level for sawlogs.	Same as Preferred.	Annual harvest levels on public land would remain constant from 1991 through 1995 for sawlogs. Harvest levels would rise in 1996 and then remain constant at the new level until the end of the analysis period.	Annual harvest levels on public land would remain constant from 1991 through 1995 for sawlogs. Harvest levels would decrease in 1996 and then remain constant at the new level until the end of the analysis period.

TABLE 15
ASSUMPTIONS FOR ANALYSIS BY ALTERNATIVE

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
FORESTLAND MANAGEMENT (Continued)	During the analysis period, about 30 million board feet would be harvested from lands not administered by BLM. These would comprise 27 million board feet of sawlogs, 2.25 million board feet of posts and poles, and 750 thousand board feet of firewood.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Annual harvest levels of sawlogs on lands not administered by BLM remained constant during 1991 through 1993 and would also remain constant during 1999 through 2005 at a level of about 500 thousand board feet annually. During 1994 through 1998, harvest levels on these lands would increase sharply to about 4 to 5 million board feet of sawlogs annually. The annual harvest levels for posts, poles, and firewood would remain constant throughout the analysis period at the 1990 level.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Timber harvests and other forest treatments would affect between 1,500 and 1,900 acres of public land.	Same as Preferred.	Between 1,900 and 2,250 acres would be affected.	Between 750 and 1,500 acres would be affected.
	During the analysis period, about 750 thousand board feet of firewood would be offered for sale from limber pine and juniper woodlands on public lands. These sales would be in conjunction with prescribed fires.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 15
ASSUMPTIONS FOR ANALYSIS BY ALTERNATIVE

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
FORESTLAND MANAGEMENT (Continued)	About 15 miles of roads would be built or upgraded to meet planned harvest needs during the analysis period. The same mileage would be reclaimed or closed.	Same as Preferred.	About 30 miles of roads would be built or upgraded during the analysis period. These roads would be closed only to protect significant resource values.	Less than 15 miles of roads would be built or upgraded during the analysis period. All roads would be reclaimed as soon as possible.
LANDS AND REALTY MANAGEMENT	Public easements of up to 20 miles would be obtained on about 10 to 20 roads during the analysis period.	Same as Preferred.	Public easements of up to 45 miles would be obtained on about 10 to 20 roads during the analysis period.	Same as Preferred.
Access				
Landownership Adjustments	During the analysis period, about 750 acres of public land would go to private ownership through mineral patents, R&PP patents, and public sale to support community expansion needs. More than 2,000 acres of public land would become private through exchanges and an equal acreage would be acquired through exchange.	Same as Preferred.	Same as Preferred.	Same as Preferred.
Rights-of-Way	During the analysis period, about 200 to 250 public land acres would be disturbed by pipeline rights-of-way, 80 to 120 acres by power line construction, 600 to 700 acres by road rights-of-way, and 100 to 200 acres by other types of rights-of-way construction.	Same as Preferred.	During the analysis period, about 250 to 300 public land acres would be disturbed by pipeline rights-of-way, 60 to 100 acres by power line construction, 700 to 800 acres by road rights-of-way, and 150 to 250 acres by other types of rights-of-way construction.	During the analysis period, about 180 to 220 public land acres would be disturbed by pipeline rights-of-way, 120 to 160 acres by power line construction, 500 to 600 acres by road rights-of-way, and 100 to 150 acres by other types of rights-of-way construction.

TABLE 15
ASSUMPTIONS FOR ANALYSIS BY ALTERNATIVE

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
Rights-of-Way **(Continued)**	The following major rights-of-way would be constructed or upgraded during the analysis period: Western Area Power transmission line between Thermopolis, Little Buffalo Basin, and Meeteetse; the Altamont natural gas pipeline from Canada to Opal, Wyoming; and the Buffalo Creek and Meeteetse South sections of Wyoming 120.	Same as Preferred.	Same as Preferred.	Same as Preferred.
Withdrawals	All coal and phosphate classifications would be terminated and the lands would be returned to operation of the General Mining Laws. These lands comprise 129,160 acres of public land (surface and minerals administered by BLM) classified for coal development, and 7,730 acres classified for phosphate development. An additional 39,373 and 4,399 acres of coal and phosphate classifications, respectively, on split estate lands (BLM-administered minerals and private or state surface) would be included in the termination.	All coal and phosphate classifications would be retained and those lands would remain closed to the staking of mining claims for gypsum, bentonite, and other nonmetalliferous minerals.	Same as Preferred.	Same as Preferred.
LIVESTOCK GRAZING MANAGEMENT	During the 1990 base year for analysis, total authorized grazing on public lands (active preference) within grazing allotments was 101,451 AUMs annually.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 15
ASSUMPTIONS FOR ANALYSIS BY ALTERNATIVE

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
LIVESTOCK GRAZING MANAGEMENT (Continued)	During the 1990 base year for analysis, total authorized grazing on all lands managed-in-common within grazing allotments was 157,355 AUMs annually.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	During the 1990 base year for analysis, actual use on all lands managed-in-common within grazing allotments was 130,926 AUMs annually. This actual use comprised 75,178 AUMs on public lands, 12,647 AUMs on state-owned lands, 759 AUMs on BOR-administered lands, and 42,342 AUMs on privately-owned lands.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	During the 1990 base year for analysis, estimated actual use outside grazing allotments was 36,900 AUMs annually. (None of this use was administered by the BLM.) This use would remain constant throughout the analysis period.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	During the 1990 base year for analysis, livestock grazed on public lands consisted of 24,857 sheep, 81,933 cattle, and 687 horses. Livestock operations using public lands totaled 102 and $139,831 in grazing fees were paid to the BLM (based on $1.86 per AUM).	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 15
ASSUMPTIONS FOR ANALYSIS BY ALTERNATIVE

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
LIVESTOCK GRAZING MANAGEMENT (Continued)	Anticipated authorized grazing within grazing allotments on all lands managed-in-common would be 102,370 AUMs annually at the end of the analysis period.	Anticipated authorized grazing within grazing allotments on all lands managed-in-common would be 111,450 AUMs annually at the end of the analysis period.	Anticipated authorized grazing within grazing allotments on all lands managed-in-common would be 113,540 AUMs annually at the end of the analysis period.	Anticipated authorized grazing within grazing allotments on all lands managed-in-common would be 84,150 AUMs annually at the end of the analysis period.
	Anticipated authorized grazing (active preference) within grazing allotments on public lands would be 66,000 AUMs annually at the end of the analysis period.	Anticipated authorized grazing (active preference) within grazing allotments on public lands would be 71,000 AUMs annually at the end of the analysis period.	Anticipated authorized grazing (active preference) within grazing allotments on public lands would be 73,000 AUMs annually at the end of the analysis period.	Anticipated authorized grazing (active preference) within grazing allotments on public lands would be 54,000 AUMs annually at the end of the analysis period.
	Grazing use would be adjusted at a constant rate during the analysis period, reaching anticipated levels as activity plans are implemented.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Activity plans would be developed or updated for all "I" category allotments at a rate of about 3 a year. (About 397,700 acres are included in livestock grazing activity plans and agreements, presently.)	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Range projects and treatments would usually be developed or applied in "I" category allotments. It is anticipated that project development would include construction of 50 miles of fence, 20 reservoirs, 10 springs, 10 miles of pipelines and 10 wells during the analysis period.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 15
ASSUMPTIONS FOR ANALYSIS BY ALTERNATIVE

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
MINERALS MANAGEMENT	It is anticipated that about 40 acres of BLM-administered coal would be developed during the analysis period, with 5 to 10 acres disturbed annually. Anticipated annual production from BLM-administered lands would be about 50,000 tons beginning in 1998.	Same as Preferred.	Same as Preferred.	Same as Preferred.
Leasable Minerals				
Coal	Anticipated coal production from lands not administered by BLM would be from 50,000 to 100,000 tons annually, during the analysis period.	Same as Preferred.	Same as Preferred.	Same as Preferred.
Geothermal	No geothermal leasing or development interest has been identified in the planning area. It is anticipated that development would not occur within the analysis period.	Same as Preferred.	Same as Preferred.	Same as Preferred.
Gas and Oil	During the 1990 base year for analysis, total gas production on all lands in the planning area was about 7.6 billion cubic feet; total oil production was about 7.6 million barrels.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	In 1990, there were 42 producing gas wells and 788 producing oil wells on all lands in the planning area. An average gas well produced 161,700 thousand cubic feet of gas in 1990; an average oil well produced 9,600 barrels of oil. There were 26 active, 4 shut-in, and 7 abandoned gas and/or oil fields in 1990.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 15
ASSUMPTIONS FOR ANALYSIS BY ALTERNATIVE

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
Gas and Oil (Continued)	During the 1990 base year for analysis, total gas production on BLM-administered lands in the planning area was about 6.4 billion cubic feet; total oil production was about 5.5 million barrels.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	During the 1991-2005 analysis period, total gas production on all lands in the planning area would be about 183 billion cubic feet, based on an assumption that production would increase by 5.87 percent annually; total oil production would be about 110 million barrels, based on an assumption that production would decrease by 2.74 percent annually.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	During the 1991-2005 analysis period, total gas production on BLM-administered lands in the planning area would be about 154 billion cubic feet; total oil production would be about 79 million barrels.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	During the analysis period, BLM-administered mineral estate would contribute about 84 percent of the gas production and 72 percent of the oil production in the planning area. Within existing gas and oil fields, BLM-administered lands would comprise about 79 percent of the total mineral estate acreage.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 15
ASSUMPTIONS FOR ANALYSIS BY ALTERNATIVE

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
Gas and Oil **(Continued)**	During 1990, the price of gas was about $1.80 per cubic foot; the price of oil was about $20 per barrel. During the analysis period the price of gas and oil would remain constant.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	About 28 wildcat wells and 130 development wells (for gas and/or oil) would be drilled in the planning area during the analysis period. The 28 wildcat wells would include about 15 wells authorized by BLM for exploration of the BLM-administered mineral estate. The estimated 130 development wells would include about 100 wells authorized by BLM primarily in the Hamilton Dome, Grass Creek, and Little Buffalo Basin fields.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	It is anticipated that two new fields would be discovered during the analysis period, affecting lands administered by the BLM. Each field would be small, consisting of eight oil wells on approximately 160 acres, or a single gas well on less than 10 acres.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	The recoverable reserves of the new fields would be about 500,000 barrels of oil or 5 billion cubic feet of gas, during the life of the fields, which could range from 50 to 75 years.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 15
ASSUMPTIONS FOR ANALYSIS BY ALTERNATIVE

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
Gas and Oil **(Continued)**	No large projects are anticipated that would make use of horizontal drilling or development of coalbed methane. No interest has been expressed in mining for tar sands or asphalt.	Same as Preferred.	Same as Preferred.	Same as Preferred.
Locatable Minerals	About 300 acres of disturbance would be caused by bentonite exploration and mining during the analysis period. About 200 acres would be disturbed by exploration activity on mining claims located for gypsum, sulphur, and titanium-bearing sandstone.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Bentonite would be mined from one or two pits on public land starting in 1996. Annual production would average 100,000 tons.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	The number of active mining claims would decrease because of new mining claim rental fees ($100 per claim per year, effective through 1998) and anticipated reform of the 1872 Mining Law.	Same as Preferred.	Same as Preferred.	Same as Preferred.
Salable Minerals	About 100 acres would be disturbed by exploration and mining for salable minerals on public lands.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 15
ASSUMPTIONS FOR ANALYSIS BY ALTERNATIVE

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
Salable Minerals **(Continued)**	During the 1990 base year for analysis, 20 sand and gravel mines on public lands produced a total of 43,000 cubic yards; production from 4 quarries totaled about 15 tons of moss rock and flagstone and 417 cubic yards of scoria.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	During the 1990 base year for analysis, the value of sand and gravel produced from public land was $15,050 based on an appraised value of $0.35 per cubic yard; the value of moss rock was $63 based on an appraised value of $7 per ton; the value of flagstone was $30 based on an appraised value of $5 per ton; and the value of scoria was $125 based on an appraised value of $0.30 per cubic yard.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	During the 1990 base year for analysis, about 50 percent of the sand and gravel, 90 percent of the scoria, 50 percent of the moss rock, and 75 percent of the flagstone produced in the planning area came from public land.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	It is anticipated that annual production of sand and gravel, moss rock, and flagstone would increase about one percent during the analysis period on public, state, and private lands.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 15
ASSUMPTIONS FOR ANALYSIS BY ALTERNATIVE

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
Geophysical	It is estimated that geophysical exploration would occur on about 150 miles of seismic lines during the analysis period.	Same as Preferred.	Same as Preferred.	Same as Preferred.
RECREATION MANAGEMENT	During the 1990 base year for analysis, annual recreational use on all lands in the planning area (regardless of ownership) was about 256,400 visitor days. *This use consisted of:* *Resident/Nonresident Days For Nonconsumptive Recreation:* Boating/Canoeing: 425/425 Camping: 2,250/1,500 Hiking: 3,575/625 Picnicking: 3,825/3,000 Sightseeing: 1,125/1,575 4-Wheel Driving: 3,450/200 Snowmobiling: 400/25 Other: 9,000/3,500 *Resident/Nonresident Days For Consumptive Recreation:* Hunting For Elk: 7,100/300 Pronghorn Antelope: 550/150 Deer: 24,000/3,000 Moose: 40/0 Sage Grouse: 13,360/1,400 Small game/waterfowl: 25,000/0 Fishing: 68,150/76,850 Trapping: 1,450/150	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 15
ASSUMPTIONS FOR ANALYSIS BY ALTERNATIVE

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
RECREATION MANAGEMENT (Continued)	During the 1990 base year for analysis, annual recreational use on public lands in the planning area was about 81,175 visitor days. *This use consisted of:* *Resident/Nonresident Days For Nonconsumptive Recreation:* Boating/Canoeing: 25/25 Camping: 2,025/1,350 Hiking: 3,200/575 Picnicking: 2,875/2,250 Sightseeing: 1,025/1,400 4-Wheel Driving: 2,950/150 Snowmobiling: 200/25 Other: 4,600/1,800 *Resident/Nonresident Days For Consumptive Recreation:* Hunting For Elk: 2,600/100 Pronghorn Antelope: 475/125 Deer: 13,439/1,650 Moose: 11/0 Sage Grouse: 8,900/1,000 Small game/waterfowl: 21,300/0 Fishing: 2,700/3,100 Trapping: 1,225/75	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Recreational use on all lands in the planning area (regardless of ownership) would reach 373,435 visitor days annually by the end of the analysis period. *This use would consist of:*	Recreational use on all lands in the planning area (regardless of ownership) would reach 337,390 visitor days annually by the end of the analysis period. *This use would consist of:*	Recreational use on all lands in the planning area (regardless of ownership) would reach 357,800 visitor days annually by the end of the analysis period. *This use would consist of:*	Same as Preferred.

TABLE 15
ASSUMPTIONS FOR ANALYSIS BY ALTERNATIVE

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
RECREATION MANAGEMENT (Continued)	*Resident/Nonresident Days For Nonconsumptive Recreation:* Boating/Canoeing: 625/625 Camping: 4,275/2,675 Hiking: 6,200/1,400 Picnicking: 5,575/4,475 Sightseeing: 2,650/2,800 4-Wheel Driving: 6,025/400 Snowmobiling: 575/25 Other: 13,100/5,100	*Resident/Nonresident Days For Nonconsumptive Recreation:* Boating/Canoeing: 550/550 Camping: 3,950/2,475 Hiking: 5,700/1,325 Picnicking: 5,050/3,950 Sightseeing: 2,475/2,575 4-Wheel Driving: 5,550/375 Snowmobiling: 475/50 Other: 11,850/4,600	*Resident/Nonresident Days For Nonconsumptive Recreation:* Boating/Canoeing: 600/600 Camping: 4,150/2,600 Hiking: 6,000/1,375 Picnicking: 5,325/4,175 Sightseeing: 2,575/2,700 4-Wheel Driving: 5,825/375 Snowmobiling: 550/25 Other: 12,550/4,875	Same as Preferred
	Resident/Nonresident Days For Consumptive Recreation: Hunting For Elk: 10,325/425 Pronghorn Antelope: 800/225 Deer: 34,950/4,375 Moose: 60/0 Sage Grouse: 19,450/2,050 Small game/waterfowl: 36,400/0 Fishing: 95,225/110,300 Trapping: 2,100/225	*Resident/Nonresident Days For Consumptive Recreation:* Hunting For Elk: 9,350/400 Pronghorn Antelope: 725/200 Deer: 31,575/3,950 Moose: 40/0 Sage Grouse: 17,575/1,850 Small game/waterfowl: 32,900/0 Fishing: 85,700/99,525 Trapping: 1,900/200	*Resident/Nonresident Days For Consumptive Recreation:* Hunting For Elk: 9,900/425 Pronghorn Antelope: 775/200 Deer: 33,500/4,175 Moose: 50/0 Sage Grouse: 18,650/1,950 Small game/waterfowl: 34,900/0 Fishing: 91,100/105,650 Trapping: 2,025/200	

TABLE 15
ASSUMPTIONS FOR ANALYSIS BY ALTERNATIVE

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
RECREATION MANAGEMENT (Continued)	Recreational use on public lands would reach 118,200 visitor days annually by the end of the analysis period. *This use would consist of:* *Resident/Nonresident Days For Nonconsumptive Recreation:* Boating/Canoeing: 25/25 Camping: 3,150/2,575 Hiking: 5,700/1,000 Picnicking: 4,775/3,925 Sightseeing: 1,650/2,475 4-Wheel Driving: 5,000/275 Snowmobiling: 350/25 Other: 7,800/3,050 *Resident/Nonresident Days For Consumptive Recreation:* Hunting For Elk: 3,600/100 Pronghorn Antelope: 625/175 Deer: 18,054/2,232 Moose: 14/0 Sage Grouse: 12,050/1,350 Small game/waterfowl: 28,600/0 Fishing: 3,675/4,125 Trapping: 1,700/100	Recreational use on public lands would reach 106,825 visitor days annually by the end of the analysis period. *This use would consist of:* *Resident/Nonresident Days For Nonconsumptive Recreation:* Boating/Canoeing: 25/25 Camping: 3,400/2,275 Hiking: 5,375/950 Picnicking: 4,800/3,775 Sightseeing: 1,700/2,350 4-Wheel Driving: 4,925/250 Snowmobiling: 350/25 Other: 7,700/3,000 *Resident/Nonresident Days For Consumptive Recreation:* Hunting For Elk: 3,100/100 Pronghorn Antelope: 550/150 Deer: 15,563/1,925 Moose: 12/0 Sage Grouse: 10,350/1,150 Small game/waterfowl: 24,700/0 Fishing: 3,150/3,550 Trapping: 1,525/75	Recreational use on public lands would reach 113,275 visitor days annually by the end of the analysis period. *This use would consist of:* *Resident/Nonresident Days For Nonconsumptive Recreation:* Boating/Canoeing: 25/25 Camping: 3,400/2,450 Hiking: 5,450/1,125 Picnicking: 5,150/3,725 Sightseeing: 1,600/2,600 4-Wheel Driving: 5,100/275 Snowmobiling: 350/25 Other: 7,750/3,325 *Resident/Nonresident Days For Consumptive Recreation:* Hunting For Elk: 3,300/100 Pronghorn Antelope: 550/150 Deer: 16,800/2,087 Moose: 13/0 Sage Grouse: 11,150/1,250 Small game/waterfowl: 26,600/0 Fishing: 3,375/3,825 Trapping: 1,625/75	Same as Preferred.
VEGETATION MANAGEMENT	Twenty percent of the lands treated with prescribed fire would be burned to control woodlands.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 15
ASSUMPTIONS FOR ANALYSIS BY ALTERNATIVE

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
VEGETATION MANAGEMENT (Continued)	Following a prescribed burn, vegetative production would be lower than original levels for one year. In the second growing season, grasses would increase and, in the third, total forage production and range condition would improve.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Desired plant community objectives would be met in elk and bighorn sheep habitats, if the ecological condition of the vegetation is "good" or "excellent." The same would be true in other wildlife habitats where condition is "good."	Same as Preferred.	Same as Preferred.	Same as Preferred.
WATERSHED MANAGEMENT	Sheet and rill erosion can adversely affect the productivity of upland vegetation. These types of erosion are predicted by the Revised Universal Soil Loss Equation (RUSLE).	Same as Preferred.	Same as Preferred.	Same as Preferred.
	When erosion rates exceed soil loss tolerances, vegetative production and range condition decline.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Vegetative cover and related watershed protection increase with improved range condition on loamy and sandy range sites.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 15
ASSUMPTIONS FOR ANALYSIS BY ALTERNATIVE

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
WATERSHED MANAGEMENT (Continued)	Within 5 years of seeding with native bunch grasses in the Fifteenmile Creek watershed, soil loss would be reduced by 50 percent in the seeded areas. During the analysis period, about 400 acres would be seeded.	No similar assumption.	No similar assumption.	Same as Preferred.
WILD HORSE MANAGEMENT	Two reliable water wells would be obtained for wild horse use through land exchanges or cooperative management agreements in the herd area.	One reliable water well would be obtained through land exchanges in the herd area.	No similar assumption.	Same as Preferred.
WILDLIFE AND FISH HABITAT MANAGEMENT	Desired plant community objectives are intended to maintain biological and structural diversity in vegetative communities. Meeting these objectives would, in turn, maintain the biological diversity of wildlife.	Same as Preferred.	Same as Preferred.	Same as Preferred.
General	Riparian habitats typically contain a disproportionate number of plant and animal species compared to other vegetative communities. Maintaining riparian vegetation would stabilize watersheds and maintain wildlife associated with riparian areas.	Same as Preferred.	Same as Preferred.	Same as Preferred.
Wildlife Habitat	Bighorn sheep would be reintroduced in the Absaroka and Owl Creek mountains.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 15
ASSUMPTIONS FOR ANALYSIS BY ALTERNATIVE

LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
Wildlife Habitat **(Continued)**	Timber harvest roads would reduce effective wildlife habitat by 320 acres for every mile of new road built.	Same as Preferred.	Same as Preferred.	Same as Preferred.
Fish Habitat	Streams with riparian areas in proper functioning condition and with stable channels have fisheries habitat at or near their full potential.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 16
COMPARATIVE SUMMARY OF ENVIRONMENTAL CONSEQUENCES

AFFECTED LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
AIR	The emission of particulate matter into the air from fires would affect air quality on a temporary and local basis. Annual emissions of particulate matter would measure about 1 to 4 tons. Short duration indirect effects to air quality and visibility would result if high winds produce dust storms in recently burned areas.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Other particulate emissions would result from surface-disturbing activities including fire control activities, off-road vehicle use, rights-of-way construction, mining, and gas and oil exploration and development.	Same as Preferred.	Same as Preferred.	Same as Preferred.
CULTURAL, PALEONTOLOGICAL, AND NATURAL HISTORY RESOURCES (also see Table 15)	The inventory and protection of cultural and paleontological resources would prevent unintentional damage to these resources from BLM-authorized activities. New information about these resources would be acquired through detailed inventories.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	BLM would also grant permits for the scientific study of cultural and paleontological resources on public lands. These permits would ensure that important sites are protected and new scientific information is made available to the public.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 16
COMPARATIVE SUMMARY OF ENVIRONMENTAL CONSEQUENCES

AFFECTED LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
CULTURAL, PALEONTOLOGICAL, AND NATURAL HISTORY RESOURCES (Continued)	Two significant cultural resource sites would be destroyed, because of surface disturbance on mining claims.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Native American spiritual values associated with rock art would be disturbed by bentonite exploration in the Frontier Formation (where sandstones often contain rock art). Only sites of minor importance would be affected. Important sites like the Legend Rock Petroglyph Site and rock art in the proposed Meeteetse Draw ACEC would be protected because the lands would be closed to the staking of new mining claims.	Closures would not be pursued in the Legend Rock and Meeteetse Draw areas and, compared to the Preferred Alternative, there would be greater potential for disturbance of Native American spiritual values from mining claim-related disturbance.	Same as Alternative A.	Same as Preferred.
	Opportunities for public education would increase from administration of some cultural and paleontological sites for information potential and conservation.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Visitor use and public awareness about cultural resources would increase in the proposed Meeteetse Draw Rock Art ACEC, at the Legend Rock Petroglyph Site, and in the Gebo mining area. Increased vandalism (if any) would be small, because management would emphasize public education.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 16
COMPARATIVE SUMMARY OF ENVIRONMENTAL CONSEQUENCES

AFFECTED LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
CULTURAL, PALEONTOLOGICAL, AND NATURAL HISTORY RESOURCES (Continued)	In the Meeteetse Draw and Legend Rock areas, the public would gain a better understanding of Native American spiritual concerns.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	The evaluation of historic gas and oil fields would add to the public's knowledge and appreciation of these areas and facilitate future development and reclamation.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	The requirement for conducting paleontological surveys in some areas before the authorization of surface disturbances, would result in the discovery of 10 to 20 fossil localities during the analysis period, with two localities being suitable for public education and interpretation.	No similar effect.	No similar effect.	Same as Preferred.
	There would be no significant adverse effects on lands and resources identified by the NPS as possible National Natural Landmarks.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	There would be no significant adverse effects on cultural, paleontological, or natural history resources from the sale, exchange, or transfer of lands identified as potentially suitable for disposal.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 16
COMPARATIVE SUMMARY OF ENVIRONMENTAL CONSEQUENCES

AFFECTED LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
LIVESTOCK GRAZING (also see Tables 15 and 17 and the "Socioeconomics" section)	Temporary reductions in the amount of forage available for livestock grazing would result from surface-disturbing activities such as pipeline construction, surface mining for sand and gravel, and the development of range projects. Following reclamation of these areas, forage production would return to pre-disturbance levels.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Temporary forage reductions associated with fire and timber harvesting would increase perennial grass production and grazing capacity for cattle, within three years of the disturbance.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	By the end of the analysis period, authorized grazing levels would not exceed the AUMs of forage determined to be "suitable" for livestock grazing. Judging from 1990 authorized and "suitable" levels, about 43,850 AUMs would be reduced from the total authorized grazing on lands managed-in-common within grazing allotments.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Improvements in grazing management would increase vegetation available for livestock by 8,910 AUMs during the analysis period on lands managed-in-common.	Improvements in grazing management would increase vegetation available for livestock by 8,880 AUMs during the analysis period on lands managed-in-common.	Same as Preferred.	Improvements in grazing management would increase vegetation available for livestock by 8,580 AUMs during the analysis period on lands managed-in-common.

TABLE 16
COMPARATIVE SUMMARY OF ENVIRONMENTAL CONSEQUENCES

AFFECTED LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
LIVESTOCK GRAZING (Continued)	Limits on forage utilization and other grazing constraints would decrease forage available for livestock by 20,050 AUMs during the analysis period on lands managed-in-common.	Limits on forage utilization and other grazing constraints would decrease forage available for livestock by 10,940 AUMs during the analysis period on lands managed-in-common.	Limits on forage utilization and other grazing constraints would decrease forage available for livestock by 8,880 AUMs during the analysis period on lands managed-in-common.	Limits on forage utilization and other grazing constraints would decrease forage available for livestock by 37,940 AUMs during the analysis period on lands managed-in-common.
	The anticipated net result of changes in available forage would be a 35 percent reduction in total authorized grazing and active preference from the 1990 planning area levels.	The anticipated net result of changes in available forage would be a 30 percent reduction in total authorized grazing and active preference from the 1990 planning area levels.	The anticipated net result of changes in available forage would be a 28 percent reduction in total authorized grazing and active preference from the 1990 planning area levels.	The anticipated net result of changes in available forage would be a 47 percent reduction in total authorized grazing and active preference from the 1990 planning area levels.
MINERAL RESOURCES (also see Table 15 and the "Socioeconomics" section)	Anticipated coal development on about 40 acres would require mitigation of impacts to mule deer crucial winter habitat and historic values associated with early twentieth century coal, gas, and oil development in the Grass Creek field. These protective measures would not significantly interfere with coal development.	Same as Preferred.	Anticipated coal development on about 40 acres would require mitigation of impacts to cultural and historic values. These protective measures would not significantly interfere with coal development.	Same as Preferred.
Leasable Minerals				
Coal				
Gas and Oil	"No surface occupancy" (NSO) constraints on new gas and oil leasing would apply to about 2,130 acres of BLM-administered mineral estate having high potential for gas and oil occurrence, 15,790 acres with moderate potential, and 2,280 acres with low potential.	NSO constraints on new gas and oil leasing would apply to about 2,130 acres of BLM-administered mineral estate having high potential for gas and oil occurrence, 6,375 acres with moderate potential, and 2,280 acres with low potential.	NSO constraints on new gas and oil leasing would apply to about 360 acres of BLM-administered mineral estate having high potential for gas and oil occurrence.	NSO constraints on new gas and oil leasing would apply to about 48,435 acres of BLM-administered mineral estate having high potential for gas and oil occurrence, 56,025 acres with moderate potential, and 22,365 acres with low potential.

TABLE 16
COMPARATIVE SUMMARY OF ENVIRONMENTAL CONSEQUENCES

AFFECTED LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
Gas and Oil **(Continued)**	"Controlled surface use" (CSU) constraints on new gas and oil leasing would apply to about 69,900 acres of BLM-administered mineral estate having high potential for gas and oil occurrence, 59,200 acres with moderate potential, and 9,700 acres with low potential.	CSU constraints on new gas and oil leasing would apply to about 31,665 acres of BLM-administered mineral estate having high potential for gas and oil occurrence, 33,630 acres with moderate potential, and 9,720 acres with low potential.	CSU constraints would apply to about 480 acres of BLM-administered mineral estate having high potential for gas and oil occurrence.	CSU constraints would apply to about 40,965 acres of BLM-administered mineral estate having high potential for gas and oil occurrence and 33,300 acres with moderate potential.
	Timing limitations would affect about 225,100 acres of BLM-administered mineral estate having high potential for gas and oil occurrence, 163,900 acres with moderate potential, and 10,200 acres with low potential.	Timing limitations would affect about 223,600 acres of BLM-administered mineral estate having high potential for gas and oil occurrence, 166,755 acres with moderate potential, and 10,245 acres with low potential.	Timing limitations would affect about 26,745 acres of BLM-administered mineral estate having high potential for gas and oil occurrence, 32,620 acres with moderate potential, and 9,735 acres with low potential.	Timing limitations would affect about 208,590 acres of BLM-administered mineral estate having high potential for gas and oil occurrence and 149,625 acres with moderate potential.
Locatable Minerals	The revocation of coal and phosphate classifications, where appropriate, would open up more land for locatable mineral entry and exploration.	Retaining coal and phosphate classifications would keep about 180,700 acres closed to the staking of mining claims for nonmetalliferous minerals like bentonite and gypsum. Some of these lands contain bentonite deposits that would be precluded from development.	Same as Preferred.	Same as Preferred.
	There would be no adverse effects on locatable mineral development from the sale or exchange of public lands, or from mineral withdrawals.	Same as Preferred.	Same as Preferred.	Same as Preferred.
Salable Minerals	The prohibition on sand and gravel mining within 0.5 mile of the Legend Rock Petroglyph Site would not affect county road work or gas and oil development.	The prohibition on sand and gravel mining within 3 miles of the Legend Rock Petroglyph Site would increase costs for county road maintenance, and for gas and oil development in the adjacent Hamilton Dome Field.	Same as Preferred.	Same as Preferred.

TABLE 16
COMPARATIVE SUMMARY OF ENVIRONMENTAL CONSEQUENCES

AFFECTED LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
RECREATION (also see Tables 15 and 18 and the "Socioeconomics" section.)	Recreational use on public lands in the planning area would increase by about 46 percent during the analysis period.	Recreational use on public lands in the planning area would increase by about 32 percent during the analysis period.	Recreational use on public lands in the planning area would increase by about 40 percent during the analysis period.	Same as Preferred.
	Primitive forms of recreation such as hiking, camping, and horseback riding would increase in the Absaroka Mountain foothills.	Same as Preferred.	Primitive forms of recreation would increase less than recreation dependant on motor vehicles.	Same as Preferred.
	The greatest increases in recreational use would be in the Badlands, the Gebo former coal mining area, and in the proposed Meeteetse Draw Rock Art ACEC.	The greatest increases in recreational use would be in the Gebo former coal mining area and the Red Canyon Creek area because of improved physical and legal access.	The greatest increases in recreational use would be in the Gebo former coal mining area, the Red Canyon Creek area, and in areas designated for off-road vehicle play.	Same as Preferred.
SOCIOECONOMICS *General*	During the years 1991 through 2005, the land and resource uses taking place on all lands in the planning area would impact the local economy by the expenditure of $4,014,117,593.	During the years 1991 through 2005, the land and resource uses taking place on all lands in the planning area would impact the local economy by the expenditure of $4,007,087,333.	During the years 1991 through 2005, the land and resource uses taking place on all lands in the planning area would impact the local economy by the expenditure of $4,018,355,907.	During the years 1991 through 2005, the land and resource uses taking place on all lands in the planning area would impact the local economy by the expenditure of $4,001,340,859.
	Land and resource uses taking place on just BLM-administered lands would contribute $2,495,794,080 to the local economy during the same period.	Land and resource uses taking place on just BLM-administered lands would contribute $2,495,858,740 to the local economy during the same period.	Land and resource uses taking place on just BLM-administered lands would contribute $2,502,145,165 to the local economy during the same period.	Land and resource uses taking place on just BLM-administered lands would contribute $2,486,854,340 to the local economy during the same period.
	The differences among the alternatives are insignificant (less than 1 percent) for these total impacts on the local economy. The same is true when the impacts on personal income and employment are compared.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 16
COMPARATIVE SUMMARY OF ENVIRONMENTAL CONSEQUENCES

AFFECTED LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
SOCIOECONOMICS *Forest Management*	Timber harvesting on all lands in the planning area would impact the local economy by the expenditure of $26,516,355 during the analysis period.	Same as Preferred.	Timber harvesting on all lands in the planning area would impact the local economy by the expenditure of $29,590,715 during the analysis period.	Timber harvesting on all lands in the planning area would impact the local economy by the expenditure of $24,979,175 during the analysis period.
	On public lands, timber harvesting would contribute $4,035,098 during the analysis period.	Same as Preferred.	On public lands, timber harvests would contribute $7,109,458 during the analysis period.	On public lands, timber harvests would contribute $2,497,918 during the analysis period.
SOCIOECONOMICS *Livestock Grazing*	Livestock grazing on all lands in the planning area would impact the local economy by the expenditure of $133,819,933 during the analysis period.	Livestock grazing on all lands in the planning area would impact the local economy by the expenditure of $139,421,203 during the analysis period.	Livestock grazing on all lands in the planning area would impact the local economy by the expenditure of $140,710,482 during the analysis period.	Livestock grazing on all lands in the planning area would impact the local economy by the expenditure of $122,580,379 during the analysis period.
	On public lands, livestock grazing would contribute $95,474,286 during the analysis period.	On public lands, livestock grazing would contribute $98,558,686 during the analysis period.	On public lands, livestock grazing would contribute $99,792,446 during the analysis period.	On public lands, livestock grazing would contribute $88,071,728 during the analysis period.
SOCIOECONOMICS *Minerals*	Coal development on all lands in the planning area would impact the local economy by the expenditure of over $26,000,000 with about one half of this contributed by mining on BLM-administered lands.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	The contribution to the total economy from gas and oil development would be about $3.7 billion, with BLM-administered mineral estate accounting for almost 63 percent of the total.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 16
COMPARATIVE SUMMARY OF ENVIRONMENTAL CONSEQUENCES

AFFECTED LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
SOCIOECONOMICS *Recreation*	Recreation on all lands in the planning area would impact the local economy by the expenditure of $130,131,915 during the analysis period.	Recreation on all lands in the planning area would impact the local economy by the expenditure of $117,500,385 during the analysis period.	Recreation on all lands in the planning area would impact the local economy by the expenditure of $124,405,320 during the analysis period.	Same as Preferred.
	On public lands, recreation would contribute $30,134,040 during the analysis period.	On public lands, recreation would contribute $27,114,300 during the analysis period.	On public lands, recreation would contribute $29,092,605 during the analysis period.	Same as Preferred.
SOILS AND WATER	The amount of erosion delivered to streams would be about 460,710 tons per year representing a 2 percent decrease from 1990 levels of erosion and stream sediment yield.	The amount of erosion delivered to streams would be about 466,300 tons per year representing an 1 percent decrease from 1990 levels of erosion and stream sediment yield.	The amount of erosion delivered to streams would be about 462,200 tons per year representing a 2 percent decrease from 1990 levels of erosion and stream sediment yield.	The amount of erosion delivered to streams would be about 455,700 tons per year representing an 3 percent decrease from 1990 levels of erosion and stream sediment yield.
VEGETATION *Forestlands*	The number of public land acres having aspen would increase by 200 percent.	Same as Preferred.	The number of public land acres having aspen would increase by 150 percent.	The number of public land acres having aspen would increase by 50 percent.
	The number of public land acres classified as woodlands would increase by about 5 percent.	Woodlands would increase by about 7 percent on public lands.	Woodlands would increase by about 1 percent on public lands.	Woodlands would increase by about 6 percent on public lands.
	The acreage of young commercial forests on public land would increase by 14 percent.	Same as Preferred.	The acreage of young commercial forests would increase by 68 percent.	Young commercial forests would be unchanged from the 1990 acreage.
	The acres of mature forests on public land would be generally unchanged and overmature/old growth forests would decline by about 10 percent.	Mature forests would be generally unchanged and overmature/old growth forests would decline by about 11 percent on public lands.	Mature forests would decline by 9 percent and overmature/old growth forests would decline by 26 percent on public lands.	Mature forests would increase by 4 percent and overmature/old growth forests would increase by 21 percent on public lands.
	About 85 percent of the public commercial forestland would be mature or overmature at the end of the analysis period.	Same as Preferred.	About 77 percent of the public commercial forestland would be mature or overmature at the end of the analysis period.	About 86 percent of the public commercial forestland would be mature or overmature at the end of the analysis period.

TABLE 16
COMPARATIVE SUMMARY OF ENVIRONMENTAL CONSEQUENCES

AFFECTED LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
Rangelands	In 1990, 34 grazing allotments had upward trends in vegetative condition on about 22,000 acres. Trend was considered to be static on 75 allotments. About 49 allotments had a downward trend on about 15,000 acres.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	By the year 2005, an estimated 62 allotments would have an upward trend on about 74,400 acres.	By the year 2005, an estimated 55 allotments would have an upward trend on about 70,800 acres.	By the year 2005, an estimated 60 allotments would have an upward trend on about 71,700 acres.	By the year 2005, an estimated 92 allotments would have an upward trend on about 89,400 acres.
	Vegetative trend on the remaining allotments would be static, and declining trend associated with livestock grazing would be largely eliminated.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Properly-functioning riparian areas on public land would increase from 1,140 to 1,300 acres.	Properly-functioning riparian areas on public land would increase from 1,140 to 1,290 acres.	Same as Alternative A.	Properly-functioning riparian areas on public land would increase from 1,140 to 1,390 acres.
	Functioning-at-risk riparian areas having upward trends would increase from 240 to 410 acres, while those having downward trends would decrease from 610 to 360 acres.	Functioning-at-risk riparian areas having upward trends would increase from 240 to 400 acres, while those having downward trends would decrease from 610 to 370 acres	Same as Alternative A.	Functioning-at-risk riparian areas having upward trends would increase from 240 to 430 acres, while those having downward trends would decrease from 610 to 290 acres.
	Nonfunctioning riparian areas would decrease from 270 to 190 acres.	Nonfunctioning riparian areas would decrease from 270 to 200 acres.	Same as Alternative A.	Nonfunctioning riparian areas would decrease from 270 to 150 acres.
	Planning areawide, the total acres of riparian areas on public lands would remain at about 2,260, or would increase slightly.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 16
COMPARATIVE SUMMARY OF ENVIRONMENTAL CONSEQUENCES

AFFECTED LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
Rangelands **(Continued)**	There would be no significant effect on known or potential threatened, endangered, or sensitive plant species in the planning area.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	Management emphasis associated with designation of the Upper Owl Creek ACEC would facilitate the identification and protection of rare and sensitive plants such as sweet-flowered rock jasmine, Evert's wafer-parsnip, Wyoming tansymustard, Rocky Mountain twinpod, and shoshonea.	Rare and sensitive plants in the upper Owl Creek area would be protected on a case-by-case, in response to proposed surface-disturbing activities.	Same as Alternative A.	Same as Preferred.
WILD HORSES	The installation of about 0.5 mile of "let down" fence along historic horse trails would allow horses to travel throughout the herd area and would keep cattle in the Tatman Common and Snyder allotments.	No similar effect.	No similar effect.	Same as Preferred.
	The accomplishment of forage utilization and desired plant community objectives, and the use of forage allocations (2,300 AUMs annually to horses), would maintain suitable habitat for the 70 to 160 adult horses. Maintaining this herd size would also ensure sufficient genetic diversity within the herd.	Same as Preferred.	No similar effect.	Same as Preferred.
	The consolidation of public and private lands through exchange, or the development of cooperative agreements, would improve wild horse management.	Same as Preferred.	No similar effect.	Same as Preferred.

TABLE 16
COMPARATIVE SUMMARY OF ENVIRONMENTAL CONSEQUENCES

AFFECTED LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
WILD HORSES (Continued)	New opportunities would be available for the public to view wild horses.	Same as Preferred.	No similar effect.	Same as Preferred.
WILDLIFE AND FISH *Wildlife Habitat*	The use of prescribed fire on 9,000 acres during the analysis period would improve habitat for elk, moose, and mule deer.	The use of prescribed fire on 4,500 acres during the analysis period would improve habitat for elk, moose, and mule deer, but not as much as under the Preferred Alternative.	Same as Preferred.	Same as Alternative A.
	Land exchanges would improve management of seasonal habitat areas and result in the acquisition of important wetland/riparian areas. Habitat and wildlife species diversity would increase.	Same as Preferred.	BLM would not pursue consolidation of seasonal habitat areas on isolated tracts or attempt to acquire important wetland/riparian areas. Habitat fragmentation would occur if private lands are developed without consideration for larger habitat areas. Wildlife would move from developed areas causing higher stress levels which could decrease wildlife populations.	Same as Preferred.
	Restrictions on livestock grazing would have beneficial effects on wildlife habitat.	Same as Preferred.	No similar effect.	Same as Preferred.
	Limits on forage utilization would increase available wildlife forage in Salt Desert Shrub and Salt Bottom environments, strengthening mule deer and pronghorn antelope populations.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 16
COMPARATIVE SUMMARY OF ENVIRONMENTAL CONSEQUENCES

AFFECTED LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
Wildlife Habitat **(Continued)**	Woody riparian vegetation would increase in winter habitat areas for mule deer and moose, causing habitats to expand along stream valleys. More riparian habitat would be available for white-tailed deer, pheasants, mourning doves, and neotropical migrant song birds.	Woody riparian vegetation would increase in winter habitat areas for mule deer and moose, but on fewer acres than under the Preferred Alternative.	Compared to the other alternatives, woody riparian vegetation would decrease, reducing mule deer and moose habitat along streams.	Same as Preferred.
	Limits on surface-disturbing activities would maintain habitat security in sage grouse strutting, breeding, and nesting areas.	Same as Preferred.	No similar effect.	Same as Preferred.
	Off-road vehicle use would be limited to designated roads and trails and/or limited seasonally in the Absaroka Mountain foothills and in the Badlands. This would help maintain habitat security in most big game use areas.	Off-road vehicle use would be limited to designated roads and trails and/or limited seasonally in the Absaroka Mountain foothills. This would help maintain habitat security in elk and mule deer use areas.	The reduced emphasis on off-road vehicle limitations would have the effect of diminishing habitat security for elk, mule deer, and pronghorn antelope.	Same as Preferred.
	Some habitat fragmentation would continue on elk and mule deer winter ranges north of the Absaroka Mountain foothills. In this area, public lands are isolated and ORV use would be allowed on existing roads and trails.	Same as Preferred.	Same as Preferred.	Same as Preferred.
	No similar effect.	Other effects of ORV use would be reduced habitat security for mule deer and pronghorn antelope in the Badlands.	Same as Alternative A.	No similar effect.

TABLE 16
COMPARATIVE SUMMARY OF ENVIRONMENTAL CONSEQUENCES

AFFECTED LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
Wildlife Habitat **(Continued)**	No similar effect.	No similar effect.	The establishment of an additional off-road vehicle play area near the town of Basin could disrupt pronghorn fawning during the spring, reducing reproductive success by 20 percent.	No similar effect.
	Vegetation management using desired plant community objectives would maintain necessary forage for big game on crucial winter ranges and birthing areas, and maintain habitat for sage grouse strutting, breeding, and nesting.	The use of desired plant community objectives would maintain necessary forage for big game on crucial winter ranges and some birthing areas and maintain habitat for sage grouse strutting, breeding, and nesting. Elk and pronghorn antelope birthing areas would lack specific vegetative community objectives.	The use of desired plant community objectives would maintain necessary forage for wildlife on elk crucial winter ranges and moose crucial winter and calving areas. Other habitat areas would lack specific objectives.	The use of desired plant community objectives would maintain necessary forage for big game on all winter, crucial winter, and birthing habitat areas; and maintain habitat for sage grouse strutting, breeding, and nesting.
	By accomplishing desired plant community objectives, habitat diversity and security would increase and so would the number of animal species using the planning area.	Habitat quality and diversity would be improved compared to the 1990 base year for analysis, but not as much as in the Preferred Alternative.	Compared to the 1990 base year, habitat quality and diversity would improve slightly for some big game winter and birthing areas, and for sage grouse habitat. The improvement in sage grouse habitat would exceed that of Alternative A.	This alternative would provide the greatest amount of habitat diversity and security.
	There would be no significant effect on known or potential threatened, endangered, or sensitive wildlife or fish species in the planning area, including bald eagles, wolves, grizzly bears, peregrine falcons, or black-footed ferrets.	Same as Preferred.	Same as Preferred.	Same as Preferred.

TABLE 16
COMPARATIVE SUMMARY OF ENVIRONMENTAL CONSEQUENCES

AFFECTED LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
Fish Habitat	About 2 miles of stream would improve from nonfunctioning condition to functioning-at-risk condition; and 13 miles of stream would improve from functioning-at-risk to properly functioning, on public land streams containing fish.	About 1.6 miles of stream would improve from nonfunctioning condition to functioning-at-risk condition; and 10.1 miles of stream would improve from functioning-at-risk to properly functioning, on public land streams containing fish.	Same as Alternative A.	About 2.4 miles of stream would improve from nonfunctioning condition to functioning at-risk condition; and 16.2 miles of stream would improve from functioning-at-risk to properly functioning, on public land streams containing fish.
ALTERNATIVE SUMMARIES	Under this alternative, the public would have more opportunities to learn about cultural and historic resources. The management and protection of ACECs would be emphasized.	Under this alternative, the public would have more opportunities to learn about cultural and historic resources. The management and protection of ACECs would not be emphasized.	Same as Alternative A.	Same as Preferred.
	Overall forest structural diversity and associated habitat values, including biological diversity, would decline as forests grow older.	Same as Preferred.	This alternative would have the greatest improvement in structural diversity and overall forest health, because mature and overmature stands would be harvested to a greater extent. Biological diversity in these forests would increase.	This alternative would have the greatest number of mature and overmature forests and reduced biological diversity in these areas.
	Genetic diversity would be maintained in the Fifteenmile Creek wild horse herd. Horse management would be improved through land exchanges or cooperative agreements, the public would have more opportunities for viewing wild horses, and a new management area boundary would include historic, preferred wild horse habitat.	Genetic diversity would be maintained in the Fifteenmile Creek wild horse herd. Horse management would be improved through land exchanges or cooperative agreements and the public would have more opportunities for viewing wild horses. However, management capability would be hindered because horses would continue to use some lands outside the existing herd area.	The public would lose existing opportunities to view wild horses with transfer of the horses out of the planning area. Conflicts with horse use on private land would end and the herd area would become available for cattle grazing.	Genetic diversity would be maintained in the Fifteenmile Creek wild horse herd. As in the Preferred Alternative, horse management would be improved through land exchanges or cooperative agreements, the public would have more opportunities for viewing wild horses, and a new management area boundary would include historic, preferred wild horse habitat.

TABLE 16
COMPARATIVE SUMMARY OF ENVIRONMENTAL CONSEQUENCES

AFFECTED LAND USE OR RESOURCE	PREFERRED ALTERNATIVE	CURRENT MANAGEMENT ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
ALTERNATIVE SUMMARIES (Continued)	This alternative (and Alternative C) would have the greatest increase in recreational use and a moderate decrease in authorized livestock grazing. As in the other alternatives, the amount of new exploration for gas and oil would decline slightly during the analysis period. About 1 wildcat well would be drilled each year to explore the BLM-administered mineral estate.	Recreational use would increase moderately under this alternative and authorized livestock grazing would decrease moderately. As in the other alternatives, the amount of new exploration for gas and oil would decline slightly during the analysis period.	Recreational use would increase moderately under this alternative but more than under Alternative A. Authorized livestock grazing would decrease less than in the other alternatives. As in the other alternatives, the amount of new exploration for gas and oil would decline slightly during the analysis period.	This alternative would have the greatest increase in recreational use and the greatest decrease in authorized levels of livestock grazing. As in the other alternatives, the amount of new exploration for gas and oil would decline slightly during the analysis period.
	This alternative would provide a high level of habitat security for wildlife with increased biological diversity through the accomplishment of desired plant community objectives.	This alternative would provide a moderate level of habitat security for wildlife and somewhat increased biological diversity.	This alternative would provide the least amount of habitat security for wildlife and the lowest potential for increased biological diversity except in forest habitats.	This alternative would provide the greatest habitat security for wildlife and the highest potential for increased biological diversity planning areawide.

Off-road vehicle use, improvements in public access on roads in the foothills of the Absaroka Mountains, wildfire suppression using heavy equipment and fire retardant, and land sales, may cause adverse effects to cultural resources through inadvertent damage and the loss of BLM's ability to manage the resources for public education and interpretation.

Opportunities for public education would increase from administration of some cultural and paleontological sites for information potential and conservation.

The placement of interpretive signs in the proposed Meeteetse Draw Rock Art ACEC and at the Legend Rock Petroglyph Site, and management of the Gebo mining area for interpretation and preservation, would increase public awareness about the cultural resources in these areas. An increase in vandalism could occur with increased visitor use associated with highlighting these areas. However, the increase (if any) would be small because management of these areas would emphasize public education.

In the Meeteetse Draw and Legend Rock areas, the public would gain a better understanding of Native American spiritual concerns.

The evaluation of historic sites in ten oil fields would add to the public's knowledge of and appreciation of these sites and facilitate future development and reclamation.

The requirement for conducting paleontological surveys in some areas before the authorization of surface disturbances, would result in the discovery of 10 to 20 fossil localities during the analysis period, with two localities being suitable for public education and interpretation.

There would be no significant adverse effects on lands and resources identified by in NPS inventories of possible National Natural Landmarks.

There would be no significant adverse effects on cultural, paleontological, or natural history resources from the sale, exchange, or transfer of lands identified in this alternative as potentially suitable for these types of disposal.

Livestock Grazing

Temporary reductions in the amount of forage available for livestock grazing would result from surface-disturbing activities such as pipeline construction, surface mining for sand and gravel, and the development of range projects. Following reclamation of these areas, forage production would return to pre-disturbance levels.

Temporary forage reductions associated with fire and timber harvesting would increase perennial grass production and grazing capacity for cattle, within three years of the disturbance.

Anticipated improvements in grazing management associated with the development of grazing systems and range projects would increase available forage by about 8,910 AUMs during the analysis period.

In some cases, forage available for livestock grazing would be reduced to meet desired plant community objectives in wildlife habitat areas. For example, objectives to increase aspen, shrubs, and deciduous trees in elk winter, deer winter, and moose calving habitats could reduce the amount of forage available for livestock.

Objectives in sage grouse habitat areas would limit the use of prescribed fire and other treatments to kill shrubs, reducing available forage for livestock in these areas. Constraints on vegetative treatments would affect cattle more than domestic sheep, because sheep can make greater use of shrubs. These habitat-related adjustments would be anticipated to reduce available forage for livestock grazing by 8,870 AUMs during the analysis period.

Forage totalling 2,300 AUMs would be allocated to wild horses in the Fifteenmile Wild Horse Herd Area and would not be available to livestock.

Planning areawide, limits on forage utilization would reduce available forage by up to 8,880 AUMs, although adjustments would not be necessary in some allotments if conversions to dormant season use are made.

For each alternative, a summary of forage available for livestock grazing is shown in Table 17. Using an estimated 113,510 AUMs suitable for livestock grazing, this table shows the projected authorized grazing for the year 2005.

TABLE 17
FORAGE AVAILABLE FOR LIVESTOCK

Forage Authorized, Available or Used for Livestock Grazing	AUMs Authorized, Available, or Used for Livestock Grazing[1]				
	Existing Situation	Preferred Alternative	Alternative A	Alternative B	Alternative C
Total Authorized Grazing	157,355	102,370	111,450	113,540	84,150
Active Preference	101,451	66,000	71,000	73,000	54,000
Rangeland Vegetation Inventory Available	130,989	—	—	—	—
Actual Use (1990)	130,926	—	—	—	—
Average Actual Use During 1976-1980 and 1987-1991	111,092	—	—	—	—
Available for Livestock, Based on Suitability	113,510				
Adjustments (from Suitability above):					
From Grazing Management[2&3]	—	+8,910	+8,880	+8,910	+8,580
From Constraints Protecting Elk, Moose, and Bighorn Sheep Habitat[2]	—	-8,870	-8,640	0	-16,540
From Forage Allocations to Wild Horses[4]	—	-2,300	-2,300	0	-2,300
From Limits on Forage Utilization[2]	—	-8,880[5]	0	-8,880[5]	-19,100

[1]The existing situation shows AUMs as of calendar year 1990. The Preferred Alternative and Alternatives A, B, and C reflect AUM projections at the end of calendar year 2005. With the exception of "active preference," AUM values are for all lands within grazing allotment boundaries that are managed-in-common. Active preference AUMs reflect existing and projected grazing use authorized on public lands.

[2]These adjustments are projected. Monitoring would be needed before AUMs are adjusted.

[3]Gains in forage available for livestock would be associated with management actions like the use of prescribed fire and the use of grazing systems and range projects to improve the distribution and timing of livestock grazing.

[4]These adjustments are based on existing monitoring data. Allocations would be made by grazing decisions.

[5]Adjustments would not be necessary in some allotments where season of use could be changed to winter. Overall, grazing would probably be reduced by less than 8,880 AUMs based on forage utilization limits.

Under the Preferred Alternative, forage available for livestock grazing would decrease from the 1990 authorized grazing use of 157,355 by about 35 percent, or about 54,985 AUMs on lands managed-in-common. This decrease to 102,370 AUMs means that available forage would be less than the 1990 actual use (130,926 AUMs).

Assuming a similar 35 percent decrease in forage availability on public lands, the level of active preference would be changed from the 1990 level of 101,451 AUMs, to an anticipated level of 66,000 AUMs, by the end of the analysis period.

Minerals

Coal

Coal development on about 40 acres in the Grass Creek field would require mitigation of impacts to important historic values associated with early twentieth cen-

tury gas and oil production, and coal mining itself. During severe winters surface coal mining would not be allowed if mule deer are on crucial winter ranges near the mine. These protective measures would not significantly interfere with coal development.

Gas and Oil

"No surface occupancy" (NSO) constraints on new gas and oil leasing would apply to about 2,130 acres of BLM-administered mineral estate having high potential for gas and oil occurrence, 15,790 acres with moderate potential, and 2,280 acres with low potential.

Most of these lands (17,100 acres) would be in the proposed Upper Owl Creek ACEC, on Tertiary age volcanic rocks of the Absaroka Mountain foothills. Since 1965, six exploratory wells have been drilled in or adjacent to the proposed ACEC. All were dry holes. Immediately south of the proposed ACEC, the potential for gas and oil occurrence is low, because Mesozoic age reservoir rocks are absent, and exposed Paleozoic age rocks have lost their gas and oil through erosion.

Future exploration in the Absaroka Mountain foothills would continue northeast of the proposed ACEC, where four gas and oil fields have been discovered.

"Controlled surface use" (CSU) constraints on new gas and oil leasing would apply to about 69,900 acres of BLM-administered mineral estate having high potential for gas and oil occurrence, 59,200 acres with moderate potential, and 9,700 acres with low potential.

On 61,100 acres, the CSU constraints would protect big game animals on overlapping winter ranges, birthing areas, and migration corridors by placing seasonal limitations on the operation and maintenance of gas and oil-producing facilities in newly-discovered fields.

During the analysis period, one or two exploratory wells would be drilled on these lands which include parts of the Basin-Margin Anticline and Sub-Absaroka gas and oil "plays." Plays are geologic prospects where there is a probability of commercial quantities of gas or oil being discovered. This probability is about 1 in 15 for exploratory wells in the Basin-Margin Anticline play and 1 in 22 in the Sub-Absaroka play.

If commercial quantities of gas or oil were discovered on lands affected by these CSU constraints, maintenance and operation of the new fields could be curtailed for 6 to 8 months of the year. It is anticipated that winter and spring weather conditions would require use of these constraints during portions of about 10 to 12 years during the analysis period.

However, it is likely that operators would continue to buy leases in areas affected by the CSU constraints. In the past, many of the problems associated with exploring these areas have been caused by adverse weather, topography, and unstable soils. These natural factors have closed the lands to access and would continue to do so, even if administrative constraints were not part of this alternative.

The other CSU constraints (on 77,700 acres) would be used to protect sage grouse habitat complexes (72,770 acres), sage grouse strutting areas (4,000 acres), prevent inappropriate development on landfills and shooting ranges (480 acres), and protect habitat and recreational opportunities at Wardel Reservoir (450 acres).

Controlled surface use constraints would generally require avoidance of important habitat or recreational opportunities through the selective placement of gas and oil facilities, or other mitigation. In habitat complexes, CSU constraints would not affect exploration or development unless 20 percent of the habitat were affected by direct surface disturbance or by indirect human presence. Selective placement of exploratory wells and other structures generally would be necessary if the 20 percent level were reached.

These constraints would not be anticipated to affect the number of wells drilled, and would have a minor influence on costs.

Timing limitations would be used to protect mule deer and pronghorn antelope on winter ranges and pronghorn fawning areas. These would affect about 225,100 acres of BLM-administered mineral estate having high potential for gas and oil occurrence, 163,900 acres with moderate potential, and 10,200 acres with low potential.

These limitations could prohibit exploratory drilling from two to six months during the year but would only be used when big game animals are present and cannot use adjacent lands. Winter and spring weather conditions would require use of these constraints during portions of about three to five years during the analysis period.

About 612,800 acres of BLM-administered mineral estate would be leased with standard terms and conditions.

Restrictions on gas and oil leases ultimately affect the costs of exploration and development and can have an effect on the numbers of gas and oil wells drilled. Under this alternative, approximately one exploratory well would be drilled each year to test the BLM-administered mineral estate. Other information on anticipated exploration and development is contained in Table 15.

Locatable Minerals

There would be minor adverse effects on locatable mineral exploration and development under the Preferred Alternative. Public lands along the Bighorn River, the Legend Rock Petroglyph Site, parts of the proposed Meeteetse Draw Rock Art ACEC, and all of the proposed Upper Owl Creek ACEC would be closed to mineral entry under the 1872 Mining Law.

Mineral resource potential is low along the Bighorn River and moderate, for bentonite, near the Legend Rock Petroglyph Site. Low potential and the absence of existing mining claims indicates the withdrawals would have no adverse effects on development. In the proposed Meeteetse Draw Rock Art ACEC, existing bentonite mining claims indicate high mineral development potential. In this area, withdrawals would only be pursued in the immediate vicinity of rock art and overall effects on development would be minimal.

Near the proposed Upper Owl Creek ACEC, traces of locatable minerals have been found in drill core and stream sediment samples where mineral resource potential is low to moderate for the occurrence of bentonite, zeolites, gold, and platinum group metals. Although exploration on existing mining claims would continue during the analysis period, it is not anticipated that these claims would be mined.

Neither the withdrawal, nor the proposed ACEC designation, would have an adverse effect on potential development of the mining claims.

The revocation of coal and phosphate classifications, where appropriate, would open up more land for locatable mineral entry and exploration. The opening of these lands could result in the staking of 10 to 20 new mining claims for bentonite and possibly gypsum. New mineral exploration would occur on about 300 acres, although mining on the previously classified lands is not anticipated during the analysis period.

In this alternative, there would be no adverse effects on mineral resource development from the sale or exchange of public lands. Mineral resource potential would be assessed prior to any sale or exchange. In addition, existing policy prohibits the sale or exchange of public lands having valid existing mining claims.

Salable Minerals

Under the Preferred Alternative, the area within 0.5 mile of the Legend Rock Petroglyph Site would be closed to the development of mineral materials; however, there are no existing gravel pits within this radius. Two nearby pits would continue to operate, satisfying local demand for construction materials.

The Cloverly Formation crops out along the southwestern boundary of the proposed Meeteetse Draw Rock Art ACEC. This area has potential for high quality moss rock and flagstone that would not be developed because of restrictions. However, other sources of these materials are available that can meet local demand. No sand and gravel or other salable minerals occur in the rock art area.

Recreation

Under the Preferred Alternative, planning area recreational use on public land would increase by 46 percent.

Table 15 shows anticipated recreational use on public lands in the planning area for the Preferred Alternative, at the end of the analysis period. Table 18 shows how this use would increase in various geographical areas, like the Absaroka Mountain foothills, the Badlands, and along the Bighorn River.

TABLE 18
RECREATIONAL USE ON PUBLIC LAND, EXISTING AND PROJECTED

Area	Public Land Acreage	Visitor Use Days[1]				
		Existing Situation	Preferred Alternative	Alternative A	Alternative B	Alternative C
Absaroka Foothills	68,000	21,221	33,338	32,343	36,694	33,338
Badlands	208,600	12,277	22,849	18,262	22,083	22,849
Bighorn River	1,300	10,073	15,871	12,648	14,093	15,871
Gebo-Crosby	600	690	2,567	1,458	2,195	2,567
Meeteetse Draw	6,800	1,068	2,213	1,545	1,623	2,213

TABLE 18 (continued)
RECREATIONAL USE ON PUBLIC LAND, EXISTING AND PROJECTED

Area	Public Land Acreage	Visitor Use Days[1] Existing Situation	Preferred Alternative	Alternative A	Alternative B	Alternative C
ORV Play Area(s)[2]	900	374	558	513	814	558
Red Canyon Creek	9,000	1,226	2,578	2,198	3,498	2,578
Remaining Lands	679,000	34,246	38,226	37,858	32,275	38,226
Totals	**968,000**	**81,175**	**118,200**	**106,825**	**113,275**	**118,200**

[1]The existing situation shows visitor use as of calendar year 1990. The Preferred Alternative and Alternatives A, B, and C reflect the estimated visitor use at the end of calendar year 2005.

[2]The 900 acres shown is for one play area in Alternatives A and C. In 1990 (existing situation), the play area had not been designated. In Alternative B, two play areas would be designated on about 8,200 acres.

Compared to the planning area as a whole, increases in recreational use on public lands would be about average in the Absaroka Mountain foothills and along the Bighorn River. However, primitive forms of recreation (for example, hiking and horseback riding) would increase, especially in the foothills.

The Badlands would show a slightly higher than average increase compared to the rest of the planning area. Most of this increase would be associated with hiking, and with hunting for deer and pronghorn antelope.

A moderate increase in recreation near Worland would be associated with designation of an open area for ORV "play." This designation would improve BLM's management of a popular area for driving and motorcycling. It would also help focus this use, reducing the spread of "backcountry" off-road driving in other parts of the proposed Fifteenmile Creek Watershed ACEC.

A large increase in recreational use would take place in the Gebo area because of the emphasis on public education and historical values. For the same reasons, recreational use would increase in the proposed Meeteetse Draw Rock Art ACEC where management would emphasize public education and Native American cultural values associated with rock art.

Socioeconomics

During the years 1991 through 2005, the land and resource uses taking place on all lands in the planning area would impact the local economy by the expenditure of $4,014,117,593 under the Preferred Alternative.

Land and resource uses taking place on just BLM-administered lands would contribute $2,495,794,080 to the local economy during the same period.

The differences among the alternatives are insignificant (less than 1 percent) for these total impacts on the local economy. The same is true when the impacts on personal income and employment are compared.

When looked at for selected economic sectors some differences are apparent:

- Timber harvesting on all lands in the planning area would impact the local economy by the expenditure of $26,516,355 under the Preferred Alternative. This contribution would be the same as that of Alternative A.
- On public lands, timber harvesting would contribute $4,035,098 during the analysis period, again being the same as Alternative A.
- Livestock grazing on all lands in the planning area would impact the local economy by the expenditure of $133,819,933 under the Preferred Alternative. This contribution would be about 4 percent less than that of Alternative A.
- On public lands, livestock grazing would contribute $95,474,286 during the analysis period, being about 3 percent less than Alternative A.

- Coal development on all lands in the planning area would impact the local economy by the expenditure of over $26,000,000 with about one half of this contributed by mining on BLM-administered lands. This would remain the same in all alternatives.
- The contribution to the total economy from gas and oil development would be about $3.7 billion, with BLM-administered mineral estate accounting for almost 63 percent of the total. This would remain the same in all alternatives.
- Recreation on all lands in the planning area would impact the local economy by the expenditure of $130,131,915 under the Preferred Alternative. This contribution would be about 11 percent greater than that of Alternative A.
- On public lands, recreation would contribute $30,134,040 during the analysis period, again being about 11 percent more than Alternative A.
- Recreation's beneficial impact on the local economy under this alternative would also be greater than that of Alternatives A and B for personal income and employment.

Background information is available upon request showing the annual and total impacts of the alternatives on the total economy, including impacts on personal income and employment.

Soils and Water

Most activities that remove vegetation affect soils and water. The removal of vegetation leaves the soil exposed to the erosive forces of water and wind. Heavy equipment and vehicle travel cause compaction of the soil leading to a loss of productivity and increased runoff and erosion.

Erosion would be caused by fire suppression; skidding, slash piling, and road building associated with timber harvest; construction of power lines, pipelines, roads, and highways; grazing by livestock, wild horses, and wildlife; construction of fences, reservoirs, wells, and water pipelines; the use of vegetation treatments; construction or abandonment of drill pads, roads, and other gas and oil facilities; produced water disposal; trenching and strip mining; ORV use and the construction of recreation sites.

Soil erosion from wild and prescribed fire varies appreciably depending on soil type, slope, and elevation. In the season after a wildfire or prescribed fire, soil losses are expected to average 12.0 tons per acre and 4.9 tons per acre respectively. Most of the erosion from fire management occurs during the spring and early summer because of rainfall patterns in the Bighorn Basin. This corresponds to the period when the soil is most susceptible to erosion, since the surface is loose from frost heaving and is bare. Therefore, this is a critical time for post-burn recovery of vegetation.

Soil erosion would rapidly decrease the first growing season after burning as herbaceous vegetation becomes reestablished. It is likely that after two growing seasons, erosion would be less than before the fire.

Annually this would amount to approximately 720 tons of soil loss from wildfire and 900 tons annually through prescribed burning.

Surface-disturbing activities from timber cutting, skidding, slash piling, and forest-road building also cause erosion. Sheet and rill erosion from these activities would total 880 tons per year. These impacts would last less than five years.

There are other ways that activities associated with forest management affect soil and water. Although not as prevalent today, willow spraying along waterways was conducted in an attempt to increase water yields through reduced transpiration; however, this activity has lead to channel instability and erosion.

Forest and woodland areas have increased in the planning area, partly because of aggressive fire suppression. As woodlands increase during the analysis period, peak water flows and streambank erosion would decrease slightly.

Surface-disturbing activities from the construction of power lines, pipelines, roads, and other rights-of-way would cause soil losses as high as 850 tons per year.

Most erosion associated with livestock grazing occurs in the 5- to 9-inch precipitation zone on saline upland and shallow loamy range sites. In 1990 the annual soil loss from these areas was about 325,500 tons per year above the rate of soil formation.

Because livestock grazing is such a widely dispersed land use, it can have a significant affect on vegetation, soil, water quality, and watershed stability. If livestock are not carefully managed, native perennial grasses can be replaced by shrubs such as sagebrush. This reduces the ground cover provided by vegetation, reducing soil protection. Along streams, the composition of the vegetation can also change.

Plants that protect streambanks because they are resistant to peak water flows can be replaced by plants that are resistant to livestock grazing. These grazing resistant plants are often not capable of withstanding floods. Combined adverse effects to upland ground cover and stream vegetation can cause gully development.

As allotment management plans are implemented during the analysis period, range condition would improve and there would be a slight reduction in sheet and rill erosion. Most of the management emphasis would be on the more responsive and higher producing loamy range sites and shallow loamy range sites. By the end of the analysis period sheet and rill erosion from livestock grazing would be reduced to 256,900 tons per year.

Surface-disturbing activities from mineral development would remove vegetation and displace soil, increasing sheet and rill erosion. Annual soil loss from sheet and rill erosion would be about 6,000 tons per year from gas and oil exploration and development. More than half would be from access road construction. (Access roads and well pads cause severe soil compaction.)

About 850 tons per year would be from locatable mineral exploration and 170 tons per year from salable mineral development.

The proposed ORV play area west of Worland would have the greatest impact on soils compared to other ORV and recreation uses. Soil erosion would be as high as 41 tons per acre per year where ORV use is concentrated. Soil losses from the ORV use would be as high as 12,700 tons per year. However, this would reduce off-road driving and soil erosion on adjacent lands.

Cumulative sheet and rill erosion for the activities cited above would be about 280,100 tons per year under this alternative. When gully and streambank erosion and natural erosion are added, the total erosion would be about 4,607,100 tons per year by the end of the analysis period.

The amount of erosion delivered to streams would be about 460,710 tons per year representing a 2 percent decrease from 1990 levels of erosion and stream sediment yield. Most of this decrease would be associated with the accomplishment of desired plant community objectives, the use of forage utilization objectives, and improvements in riparian functioning condition.

The disposal of produced water from gas and oil development is regulated by a notice to lessees. Most produced water is disposed of by discharging to a surface waterway. Other disposal methods are injection into a subsurface reservoir and the use of lined or unlined pits. The injection of produced water generally is limited to formations in which the quality of water is similar to or poorer than that of the injected water.

Produced water discharged to a surface waterway must meet the water quality standards of the National Pollution Discharge Elimination System which in Wyoming is administered by the DEQ. Produced water may lower the quality of receiving surface water enough to preclude its use for municipal drinking water, wildlife, recreation, or irrigation purposes.

When produced water is discharged to ephemeral channels, it can create additional aquatic habitat. The accumulation in stream channels of settleable solids like iron sulfate and oil-coated sediments also accompanies produced water discharges. Over the long term, this accumulation may render a stream incapable of supporting fish and affect channel characteristics long after produced water discharges cease.

The anticipated increased use of water reinjection wells and water floods and the shutting in of marginally profitable wells would cause a decline in the volume of produced water discharged to the planning area. This would decrease salt concentrations and other pollutants in receiving waters and lead to an improvement in water quality during the analysis period; however, wetland and riparian areas would receive less water, reducing the water available to livestock and wildlife.

The loss of riparian areas associated with produced water would be most noticeable where produced water comprises the majority of the annual yield.

Vegetation

Forestland Vegetation

Woodland encroachment would continue under the Preferred Alternative. In 1990 there were about 45,000 acres of woodlands. During the analysis period, the use of prescribed fire would slow the rate of woodland encroachment, although woodlands would increase to about 47,500 acres. Woodland encroachment would be reduced in some areas by improved livestock management and by prescribed fire. In other areas the woodlands would continue to spread.

Management actions under the Preferred Alternative would not change the acres of commercial forestland during the analysis period. However, the land available for timber harvesting may be reduced by as much as ten percent based on restrictions associated with review of the timber production capability classification. These restrictions would be based on more resource information from soil and watershed surveys.

Before the planning area was settled, the forestlands maintained an open understory of grasses and scattered shrubs because of frequent low intensity fires. The exclusion of fire during the past 100 years has increased subalpine fir and Engelmann spruce which are shade-tolerant, late seral-stage trees. As forest fuels accumulate catastrophic fire can result.

Under the Preferred Alternative, the acreage of the various forest types, other than aspen and woodlands, would not change significantly. The age class of the forests would change as shown on Table 19. Overall, the number of acres having aspen would increase; woodlands would expand by about 5 percent. The acreage of young commercial forests would increase by 14 percent.

TABLE 19
WOODLAND AND FORESTLAND COMPOSITION

	Public Woodland Acres		Public Commercial Forestland Acres		
Alternative[2]	Limber Pine and Juniper	Aspen[1]	Young Forests	Mature Forests	Overmature Forests
Existing Situation	45,000	200	1,900	10,200	1,900
Preferred Alternative	47,500	600	2,200	10,100	1,700
Alternative A	48,000	600	2,200	10,100	1,700
Alternative B	47,500	500	3,200	9,400	1,400
Alternative C	47,800	300	1,900	9,800	2,300

[1]The acres shown for aspen in this column are included in the forestland acreages to the right.

[2]The existing situation shows public woodland and forestland composition and acreages as of calendar year 1990. The Preferred Alternative and Alternatives A, B, and C reflect estimated compositions and acreages at the end of calendar year 2005.

Mature forests would be generally unchanged and overmature/old growth forests would decline by about 10 percent. About 85 percent of the commercial forestland would be mature or overmature at the end of the analysis period. Older, mature stands are more vulnerable to infestations of spruce budworm, Douglas-fir tussock moth, bark beetle, root disease, and dwarf mistletoe. Forest structural diversity, and associated wildlife habitat and biological diversity, would decline.

Rangeland Vegetation

There would be no anticipated effects on plants that are candidates for threatened or endangered listing, or on other special status vegetation.

Chemical treatments, like the use of herbicides, would be used to control noxious weeds where surface disturbances are being reclaimed. Generally, there would be no measurable adverse effects from the use of chemical treatments for reclamation, because small areas would be affected and vegetative treatment guidelines (BLM 1991) would be followed. The beneficial effects, aside from weed control, would include the establishment of desired plant communities.

Chemical treatments could also be used to control shrubs such as sagebrush, although prescribed fire is the preferred method of control. Both chemical treatments and prescribed fire would have the same effect on sagebrush; however, chemical treatments are ineffective in controlling limber pine and juniper.

Wild and prescribed fires cause a temporary loss of vegetation and biological diversity. Within three years, herbaceous vegetation would exceed preburn levels as grasses replace shrubs. Generally, range condition, total forage production, and biological diversity would improve.

The use of prescribed fire during the analysis period would increase grass production by 3.6 million pounds in the areas treated. Generally, loamy range sites in the 10- to 14-inch and 15- to 19-inch precipitation zones would be affected.

In 1990, 34 grazing allotments had upward trends in vegetative condition on about 22,000 acres. Trend was considered to be static on 75 allotments. About 49 allotments had a downward trend on about 15,000 acres. By the year 2005, an estimated 62 allotments would have an upward trend on about 74,400 acres.

Vegetative trend on the remaining allotments would be static, and declining trend associated with livestock grazing would be largely eliminated. Rangeland vegetation trend in the Preferred Alternative is compared with that of the other alternatives in Table 20.

TABLE 20
VEGETATION TREND

Alternative[1]	Upward Trend		Downward Trend		Static Trend
	Number of Allotments	Acres	Number of Allotments	Acres	Number of Allotments
Existing Situation	34	22,000	49	15,000	75
Preferred Alternative	62	74,400	0	0	96
Alternative A	55	70,800	0	0	103
Alternative B	60	71,700	0	0	98
Alternative C	92	89,400	0	0	66

[1]The existing situation shows vegetation trend as of calendar year 1990. The Preferred Alternative and Alternatives A, B, and C reflect estimated trend at the end of calendar year 2005.

Wild horses graze throughout the year, focusing on preferred forbs and grasses in favored locations. Locally, the level of grazing would be from 25 to 40 percent of the available forage. Based on these use levels the vegetation would complete its growth during the year and replenish root reserves needed for subsequent years. Vegetative trend would improve on about 3,350 acres in the herd area.

About 295,000 acres in basin grassland/shrub communities would be managed for deer, pronghorn antelope, and sage grouse habitat. Sagebrush would be managed as an important component of these habitats. Treatments to reduce sagebrush would be infrequent.

The foothills-mountain grassland/shrub community (108,700 acres) has the highest productivity and sagebrush density of all lands characterized by sagebrush. Furthermore, encroachments of limber pine and juniper are occurring on these sites. Consequently, vegetation treatments using prescribed fire are important in this plant community to maintain forage for livestock. The sagebrush on about 28,000 acres of this community is identified as important for wildlife habitat, under the Preferred Alternative. On these lands acres (comprising 26 percent of the community) the use of prescribed fire and chemical treatments would be restricted causing shrubs, limber pine, and juniper to increase.

In the Preferred Alternative, no significant effects on rangeland vegetation would be anticipated from the management of air quality, minerals, cultural, paleontological and natural history resources, recreation, and visual resources. (Although in rare cases, the discovery of cultural or paleontological resources, or the management of highly scenic areas, could preclude some vegetative treatments.)

There would be no effect on vegetation from management actions in the proposed Meeteetse Draw Rock Art ACEC. In the proposed Fifteenmile Creek Watershed ACEC, environmental consequences would be associated with the accomplishment of desired plant community objectives and management actions for wild horses. Generally, vegetation trend and riparian functioning condition would improve.

Riparian Function. Based on the anticipated development of allotment management plans and the accomplishment of desired plant community objectives, it is anticipated that by the year 2005 properly-functioning riparian areas on public land would increase from 1,140 to 1,300 acres; functioning-at-risk riparian areas having upward trends would increase from 240 to 410 acres, while those having downward trends would decrease from 610 to 360 acres; and nonfunctioning riparian areas would decrease from 270 to 190 acres. Planning areawide, the total acres of riparian areas on public lands would remain at about 2,260, or would increase slightly. Slightly larger riparian areas would result from improvements in riparian function that allow water tables to rise.

The functioning condition of riparian vegetation in the Preferred Alternative is compared with that of the other alternatives in Table 21.

TABLE 21
RIPARIAN FUNCTIONAL CONDITION

Alternative[1]	Total Riparian Acres	Properly-Functioning Acreage	Functioning-At-Risk			Non-functioning Acres
			Total Acres	Upward Trend Acres	Downward Trend Acres	
Existing Situation	2,260	1,140	850	240	610	270
Preferred Alternative	2,260	1,300	770	410	360	190
Alternative A	2,260	1,290	770	400	370	200
Alternative B	2,260	1,290	770	400	370	200
Alternative C	2,260	1,390	720	430	290	150

[1]The existing situation shows riparian acreages and conditions as of calendar year 1990. The Preferred Alternative and Alternatives A, B, and C reflect estimated acreages and conditions at the end of calendar year 2005.

Under the Preferred Alternative those riparian areas with designated moose crucial winter range, moose calving habitat, and deer crucial winter range generally would develop shrub and deciduous tree communities representing a high level of biological diversity on about 1,600 acres (70 percent) of public land riparian areas. Desired plant communities have also been established for sage grouse habitat which emphasize shrub communities. In all other riparian areas properly-functioning condition would be achieved with more herbaceous vegetation. These areas would not provide the same level of biological diversity.

Wild Horses

Acquisition of an estimated 16,000 acres of private lands in an expanded herd area, or the development of cooperative management agreements with private landowners, would improve the BLM's management of wild horses. There would be potential for wild horses to use two new water sources on the 16,000 acres, improving wild horse and wildlife distribution.

New opportunities would be available for the public to view wild horses because access would be improved. However, public access in parts of the herd area could adversely affect horse management if gates are left open. Public access could also increase disturbance of horses during the foaling season (between April 1 and July 1).

Most wild horses would remain in the part of the herd area south of Tatman Mountain. Wild horse use on and north of the mountain would continue to be minor. In the northern part of the herd area, horses and cattle would compete for many of the same forage plants. In the southern (original) part of the herd area, wild horse forage and dietary requirements would be satisfied.

The installation of about 0.5 mile of "let down" fence along historic horse trails would allow horses to travel throughout the herd area and would keep cattle in the Tatman Common and Snyder allotments.

The accomplishment of forage utilization and desired plant community objectives, and forage allocations (2,300 AUMs annually to horses) in the original herd area, would maintain suitable habitat for the 70 to 160 adult horses. Maintaining this herd size would also ensure sufficient genetic diversity within the herd.

Wildlife and Fish

Wildlife Habitat

The use of prescribed fire on 9,000 acres during the analysis period would improve habitat for elk, moose, and mule deer. Animals dependant on early seral stages would increase while those depending on climax vegetation would decrease in the areas burned.

Timber harvests would decrease thermal and hiding cover for big game by up to 1,900 acres but would also increase aspen stands and associated forage on up to 400 acres during the analysis period. Harvests would result in the loss of cover for some wildlife species but an increase in forage for others. Road construction associated with forest management would decrease security for big game on about 320 acres of habitat each year.

This habitat would lose its effectiveness because of the increased activity until roads are reclaimed. Habitat associated with dead and down trees along desert waterways would be maintained. These trees would continue to provide snags for raptor and songbird perches and nests. Downed trees would provide hiding cover for small mammals.

Public access would increase within important habitat areas of the Absaroka Mountain foothills. However, seasonal restrictions on access would be applied under the Preferred Alternative where necessary. This would protect elk, moose, and deer doe/fawn and cow/calf groups from being displaced during May and June. It would also reduce stress to big game animals on crucial winter habitat.

Under the Preferred Alternative, land exchanges would improve management of seasonal habitat areas and result in the acquisition of important wetland/riparian areas. Habitat and wildlife species diversity would increase. Land acquisition through exchanges or the use of cooperative management agreements in the wild horse herd area would make wildlife management more consistent.

The conversion of habitat (from native to agricultural) on about 400 acres of agricultural trespass lands would be mitigated by lease agreements or by prohibiting the agricultural use. Generally, these lands would return to native habitat. Because of their location within agricultural areas, the lands would be effective habitat islands, providing diversity for the benefit of game and song birds.

Most new rights-of-way would be constructed in existing right-of-way concentration areas and would not have long-term effects on wildlife. Raptors and waterfowl would continue to collide with power lines although deaths by electrocution would be reduced, as raptor-safe new and upgraded lines are built.

Under the Preferred Alternative, restrictions on livestock grazing would have beneficial effects on wildlife habitat. Limits on forage utilization would increase available wildlife forage in Salt Desert Shrub and Salt Bottom environments, strengthening mule deer and pronghorn antelope populations.

Woody riparian vegetation would increase in winter habitat areas for mule deer and moose, causing habitats to expand along stream valleys. Wetland/riparian areas that contribute to biological diversity, by containing important or significant wildlife habitats, would be fenced to protect them from livestock grazing. Overall, more habitat would be available for white-tailed deer, pheasants, mourning doves, and neotropical migrant song birds.

By prohibiting domestic sheep grazing within two miles of existing bighorn sheep habitat, the potential for the spread of disease would be low.

For all types of surface-disturbing activities, surface use and seasonal restrictions would allow big game animals to occupy the best winter and birthing habitat areas (and not be displaced to less favorable areas). Prohibitions on surface disturbance in the proposed Upper Owl Creek ACEC would protect 8,270 acres of elk crucial winter habitat and 12,430 acres of bighorn sheep winter habitat. By also prohibiting surface disturbance within 0.5 mile of the Bighorn River, the Preferred Alternative would maintain hiding, resting, nesting, and feeding areas for waterfowl, raptors (including bald eagles), song birds, and white-tailed deer.

"Controlled surface-use" restrictions would allow the application of seasonal limitations on new gas and oil production, within crucial winter ranges and birthing habitat for elk, moose, and bighorn sheep. This would ensure habitat security for those animals, and for predators like black bears, coyotes, and mountain lions.

Mule deer and pronghorn antelope would be displaced to less favorable wintering areas if new fields are discovered because seasonal restrictions would not be applied to production. Generally, wildlife in areas within 0.25 mile of roads and facilities would be disturbed.

Seasonal and "controlled surface disturbance" restrictions would maintain habitat security in sage grouse strutting, breeding, and nesting areas.

In the Absaroka Mountain foothills, exploration on mining claims for gold, silver, and platinum group minerals would have a minimal effect on habitat security. Under this alternative, locatable mineral withdrawals would be pursued in the foothills and along the Bighorn River to protect wildlife habitat. However, with or without mineral withdrawals, no mining would be anticipated for these areas during the analysis period.

Bentonite claims north and west of Thermopolis and those near Hamilton Dome would have one to two weeks of assessment drilling done annually. In the past, this assessment drilling has taken place during November through January. These activities are usually "notice" level activities that are not subject to federal discretion and, therefore, not subject to BLM-imposed seasonal limitations.

During years of heavy snowfall or colder than normal temperatures, assessment drilling would displace mule deer from their crucial winter range, decreasing survivability and reducing fawning success in the spring. During mild winters, little effect on the mule deer population would be felt because other winter habitat would be available.

Anticipated bentonite mining from one or two pits starting in 1996 would have no adverse effect on wildlife. There would also be no effects from gypsum, sulphur, and titanium exploration on mining claims, anticipated to disturb about 200 acres during the analysis period.

About 100 acres would be explored or developed for salable minerals during the analysis period. Some mining would occur on gravel terraces near the Bighorn River, but outside the half-mile Bighorn River buffer area. This activity would represent a small increase in human activity that could disrupt wintering, breeding, and nesting of waterfowl, raptors, and white-tailed deer. However, specific proposals for salable minerals development would be conditioned by seasonal limitations, or habitats would be avoided, if important raptors or other animals are using the area.

Other salable minerals development would occur on lowlands away from the immediate river corridor. This could result in a small loss of pronghorn habitat, however, the effects would be insignificant as long as fawning areas are not disturbed. To reduce potential effects to animals on crucial wintering or fawning habitat, seasonal limitations would be applied.

Under the Preferred Alternative, off-road vehicle use would be limited to designated roads and trails and/or limited seasonally in the Absaroka Mountain foothills and in the Badlands. This would help maintain habitat security in most big game use areas. Some habitat fragmentation would continue on elk and mule deer winter ranges north of the Absaroka Mountain foothills. In this area, public lands are isolated and ORV use would be allowed on existing roads and trails.

The establishment of an off-road vehicle play area west of Worland would focus driving in an existing vehicle use area at the eastern edge of the proposed Fifteenmile Creek Watershed ACEC. This would reduce the amount of dispersed "backcountry" driving in the remainder of the watershed. Islands of riparian habitat would be more secure, as would upland and stream bottom mule deer and pronghorn antelope habitat.

Under the Preferred Alternative, vegetation management using desired plant community objectives would maintain necessary forage for big game on crucial winter ranges and birthing areas, and maintain habitat for sage grouse strutting, breeding, and nesting. By accomplishing desired plant community objectives, habitat diversity and security would increase and so would the number of animal species using the planning area.

Table 22 compares the acres of wildlife habitat meeting desired plant community objectives in the 1990 base year, to projected acres meeting objectives by the end of the analysis period.

TABLE 22
WILDLIFE HABITAT MEETING DESIRED PLANT COMMUNITY OBJECTIVES

Big Game Habitat[1]	Public Lands (Acreage)	Acres Meeting Objectives in 1990	Estimated Acres Meeting Objectives in 2005			
			Preferred Alternative	Alternative A	Alternative B	Alternative C
Elk						
Crucial	26,732	4,425	12,993	10,460	3,900	12,423
Winter	54,655	10,669	15,765	15,518	7,282	23,130
Calving	16,299	3,329	10,111	8,672	3,446	10,111
Moose						
Crucial	4,739	1,390	2,592	2,353	1,387	2,465
Winter	18,993	5,758	7,653	7,644	5,519	8,121
Calving	2,235	627	1,497	1,300	761	1,630
Bighorn[2]						
Winter	13,137	1,555	7,107	2,149	2,067	7,107
Mule Deer						
Crucial	219,829	63,474	74,310	76,602	68,137	110,960
Winter	109,222	27,260	33,829	33,080	30,094	36,134
Pronghorn Antelope						
Crucial	88,570	34,605	46,859	42,937	38,465	52,263
Winter	306,132	128,069	165,633	165,588	160,732	229,310
Fawning	4,697	3,057	3,698	3,498	2,778	3,698

TABLE 22 (continued)
WILDLIFE HABITAT MEETING DESIRED PLANT COMMUNITY OBJECTIVES

Big Game Habitat[1]	Public Lands (Acreage)	Acres Meeting Objectives in 1990	Estimated Acres Meeting Objectives in 2005			
			Preferred Alternative	Alternative A	Alternative B	Alternative C
Sage Grouse Nesting	263,086	100,090	115,240	105,819	114,043	116,805

[1]Important habitat areas have not been defined for other wildlife species, therefore no DPC objectives were laid out and they were not considered in this Table. Maintaining or increasing the diversity within and between vegetative communities will also maintain or increase the wildlife species using these habitats.

[2]Bighorn sheep winter range and crucial winter range on public lands were combined for this analyses.

In the original wild horse herd area (comprising 83,130 acres) domestic livestock grazing would be restricted to sheep. Forage use by sheep would continue to conflict with habitat and forage needs of pronghorn antelope on about 9,750 acres. This could eventually reduce the amount of forage left for pronghorn antelope during crucial winters resulting in decreased productivity and reduced reproductive success. However, this potential effect would be mitigated by forage allocations under the Preferred Alternative that would reduce the amount of forage authorized for domestic sheep.

Threatened or Endangered Wildlife Species. [Threatened or endangered plants are discussed in the Rangeland Vegetation section.]

Bald eagle roosting and perching habitat would be protected by prohibitions against the cutting of cottonwood trees and by surface-disturbance restrictions along the Bighorn River. Eagles would continue to be protected from electrocution by the requirement for raptor-safe poles on new and upgraded power lines.

Grizzly bears could be adversely affected by increased public access in the Absaroka Mountain foothills, although these bears are not known to currently inhabit the planning area. Improved access would increase the potential for human-bear conflicts, requiring additional restrictions on human activity.

The Northern Rocky Mountain grey wolf is not anticipated to establish packs within the planning area. But if packs were formed, the protection of big game animals by seasonal limitations would benefit the wolves by preserving their prey.

There would be no significant adverse effects on peregrine falcons, black-footed ferrets, or other sensitive wildlife or fish species in the planning area.

Fish Habitat

A stream's fish habitat condition is closely related to water flows, sediment levels, channel stability, riparian condition, and overall watershed condition. These conditions usually change very slowly.

In the planning area, a large amount of stream sediment comes from dry, saline upland and shallow loamy range sites, in salt bottom and salt desert shrub plant communities. Generally, fish habitat within the planning area is in headwater areas, upstream from these sediment sources. This includes all the trout habitat, with the exception of the upper reach of the Bighorn River near Thermopolis, where trout habitat is affected by sediment coming from Red Canyon and Buffalo creeks. Some tributary streams and reservoirs containing nongame or warm water fish are within or downstream from areas of erodible soils.

While sedimentation rates are expected to decrease during the analysis period, this would have a much slower and smaller impact on fish habitat condition than improvements in riparian condition or channel stability. Overall, sedimentation contributed by watercourses on public lands within the planning area would decrease 2 percent during the analysis period.

This would have little impact on the headwater areas containing trout, but would have a slight benefit to the downstream waters containing nongame or warm water fish. While sedimentation of gravel beds is a primary cause of fish habitat decline in the upper Bighorn River near Thermopolis, this amount of reduction in sediment would improve river fish habitat only slightly during the analysis period.

On most streams in the planning area, channel stability and the condition of the stream's riparian vegetation

are directly related, and indicative of fish habitat condition. (Exceptions include portions of the South Fork of Owl Creek where good to excellent channel stability is maintained by boulders and rocky chutes, instead of riparian vegetation.)

When a riparian area is "properly functioning," its channel stability improves as soil is captured; vegetation grows larger, thicker, and binds soil more effectively; and the effects of scouring flows are reduced. These changes improve fish habitat by providing more overhanging banks and vegetation, deeper pools, cleaner gravels, cooler water temperatures, and more terrestrial and aquatic insects.

Planning areawide, grazing in riparian areas affects channel stability, riparian vegetation, and fish habitat more than any other land use.

Riparian conditions change quicker than other fish habitat components, such as water flows or pool to riffle ratios, and generally change as a result of vegetation management for other wildlife habitat and livestock grazing objectives. With emphasis in the Preferred Alternative on desired plant community objectives to improve riparian habitat, riparian condition and fish habitat would improve.

Under the Preferred Alternative, 2 miles of stream would improve from nonfunctioning condition to functioning-at-risk condition; and 13 miles of stream would improve from functioning-at-risk to properly functioning, on public land streams containing fish.

Preferred Alternative Summary

Under this alternative, the public would have more opportunities to learn about cultural and historic resources. The management and protection of ACECs would be emphasized.

Overall forest structural diversity and associated habitat values, including biological diversity, would decline as forests grow older.

Genetic diversity would be maintained in the Fifteenmile Creek wild horse herd. Horse management would be improved through land exchanges or cooperative agreements, the public would have more opportunities for viewing wild horses, and a new management area boundary would include historic, preferred wild horse habitat.

This alternative (and Alternative C) would have the greatest increase in recreational use and a moderate decrease in authorized livestock grazing. As in the other alternatives, the amount of new exploration for gas and oil would decline slightly during the analysis period. About 1 wildcat well would be drilled each year to explore the BLM-administered mineral estate.

This alternative would provide a high level of habitat security for wildlife with increased biological diversity through the accomplishment of desired plant community objectives.

ALTERNATIVE A

Effects on Land Uses and Resources

Air

The effects on air quality of proposed management actions in Alternative A would be the same as those described for the Preferred Alternative.

Cultural, Paleontological, and Natural History Resources

Under Alternative A, the effects on cultural, paleontological, and natural history resources would be similar to those described for the Preferred Alternative. Mineral withdrawals would not be pursued under Alternative A in the Meeteetse Draw and Legend Rock areas and, compared to the Preferred Alternative, there would be greater potential for disturbance of Native American spiritual values from mining claim-related surface-disturbing activities.

Compared to the Preferred Alternative, fewer cultural and paleontological resource sites would be developed for public education. Visitor use would be focused at the Legend Rock Petroglyph Site, in the Meeteetse Draw area, and at the town of Gebo and adjacent coal mining area.

Compared to the Preferred Alternative, there would be less emphasis on conducting site-specific inventories for paleontological resources before the start of surface-disturbing activities. As a result, 10 to 20 fewer fossil localities would be discovered during the analysis period. Of these, one or two important fossil localities would be destroyed by surface-disturbing activities.

Livestock Grazing

Under Alternative A, forage available for livestock grazing would decrease from the 1990 authorized grazing use of 157,355 by 30 percent, or about 45,905 AUMs, during the analysis period. This decrease to 111,450 AUMs means that available forage would be

less than the 1990 average actual use, but slightly above the average actual use during 1976 through 1980 and 1987 through 1991 (111,092 AUMs).

Assuming a similar 30 percent decrease in forage availability on public lands, the level of active preference would be changed from the 1990 level of 101,451 AUMs, to an anticipated level of 71,000 AUMs, by the end of the analysis period.

Minerals

Coal

The effects on coal development would be the same as those described for the Preferred Alternative.

Gas and Oil

"No surface occupancy" (NSO) constraints on new gas and oil leasing would apply to about 2,130 acres of BLM-administered mineral estate having high potential for gas and oil occurrence, 6,375 acres with moderate potential, and 2,280 acres with low potential. The protected lands are in blocks of less than 1,000 acres each and could be developed by directional drilling. No adverse effects on development are anticipated from these constraints.

"Controlled surface use" (CSU) constraints on new gas and oil leasing would apply to about 31,665 acres of BLM-administered mineral estate having high potential for gas and oil occurrence, 33,630 acres with moderate potential, and 9,720 acres with low potential. The effects of these CSU constraints, on big game habitat areas and on sage grouse strutting areas, would be the same as those described for the Preferred Alternative.

Timing limitations would be used to protect mule deer and pronghorn antelope on winter ranges and pronghorn fawning areas. These would affect about 223,600 acres of BLM-administered mineral estate having high potential for gas and oil occurrence, 166,755 acres with moderate potential, and 10,245 acres with low potential. The effect of these limitations would be the same as those described for the Preferred Alternative.

About 684,600 acres of BLM-administered mineral estate would be leased with standard terms and conditions.

The number of exploratory wells drilled under this alternative (15), and their anticipated costs, would be the same as in the Preferred Alternative.

Locatable Minerals

There would be minor adverse effects on locatable mineral exploration and development under Alternative A. Public lands along the Bighorn River would be closed to mineral entry under the 1872 Mining Law; however, the potential for locatable minerals on these lands is low and no effects on development are anticipated.

Retaining coal and phosphate classifications would keep about 180,700 acres closed to the staking of mining claims for nonmetalliferous minerals like bentonite and gypsum. Some of these lands contain bentonite deposits that would be precluded from development.

As in the Preferred Alternative, there would be no adverse effects on mineral resource development from the sale or exchange of public lands.

Salable Minerals

In this alternative, the development of mineral materials would be prohibited within 3 miles of the Legend Rock Petroglyph Site and in the Meeteetse Draw Rock Art area. Sand and gravel have been mined within 3 miles of the Legend Rock Petroglyph Site from two BLM-administered pits. There would be a continued demand for sand and gravel in this area, for use on county roads and for construction in nearby oil fields. In this alternative, the future use of these gravel deposits would not be authorized. The next closest source of gravel is 11 miles to the northeast. Use of the more distant gravel would dramatically increase costs to Hot Springs County and the oil companies.

The effect of restrictions on salable mineral development in the proposed Meeteetse Draw Rock Art ACEC would be the same as those described for the Preferred Alternative.

Recreation

Under this alternative, recreational use on planning area public lands would increase by 32 percent.

Tables 15 and 18 show anticipated recreational use on public lands in the planning area for Alternative A, at the end of the analysis period.

Limitations on vehicle access in parts of the Absaroka Mountain foothills would improve opportunities for primitive recreation along the upper South Fork of Owl Creek and near Enos and Cottonwood creeks. Activities such as hunting by horseback and hiking would increase.

Elsewhere in the Absaroka Mountain foothills, easements for vehicle access would be pursued, including one to the South Fork of Owl Creek for fishing. Overall, recreational use on public lands in the foothills would increase moderately during the analysis period.

Other moderate increases in recreational use would take place in the Badlands, along the Bighorn River, in Meeteetse Draw, and on lands west of Worland that would be designated an ORV play area. Factors contributing to this moderate increase would include recreational viewing of wild horses in the Badlands; improved physical and legal access for off-road vehicles; and the use of road turnouts and interpretive signs at places such as Meeteetse Draw where rock art would be explained to the public.

The greatest increases would be in the Gebo historic coal mining area and in the Red Canyon Creek area south of Thermopolis where acquisition of public easements would be pursued. Both areas would have improved physical or legal vehicle access. The public also would be drawn to the Gebo area because of management that would emphasize its cultural and historic values.

Socioeconomics

During the years 1991 through 2005, the land and resource uses taking place on all lands in the planning area would impact the local economy by the expenditure of $4,007,087,333 under Alternative A.

Land and resource uses taking place on just BLM-administered lands would contribute $2,495,858,740 to the local economy during the same period.

Timber harvesting on all lands in the planning area would impact the local economy by the expenditure of $26,516,355 under Alternative A.

On public lands, timber harvests would contribute $4,035,098 during the analysis period.

Livestock grazing on all lands in the planning area would impact the local economy by the expenditure of $139,421,203 under Alternative A.

On public lands, livestock grazing would contribute $98,558,686 during the analysis period.

The socioeconomic effects of coal, gas, and oil development are the same as those described for the Preferred Alternative.

Recreation on all lands in the planning area would impact the local economy by the expenditure of $117,500,385 under Alternative A.

On public lands, recreation would contribute $27,114,300 during the analysis period.

Soils and Water

As in the Preferred Alternative, wildfires would cause approximately 720 tons of soil loss annually. Prescribed fires would contribute 450 tons annually, representing about half the amount of the Preferred Alternative.

Sheet and rill erosion from timber cutting, skidding, slash piling, and forest-road building would total 880 tons per year. These impacts would last less than five years.

Surface-disturbing activities from the construction of power lines, pipelines, roads, and other rights-of-way also cause erosion. Based on anticipated activities in this alternative, soil losses would be as high as 850 tons per year.

As allotment management plans are implemented during the analysis period, range condition would improve and there would be a slight reduction in sheet and rill erosion. Most of the management emphasis would be on the more responsive and higher-producing loamy range sites and shallow loamy range sites. By the end of the analysis period sheet and rill erosion from livestock grazing would be reduced to 281,300 tons per year.

Annual soil loss from gas and oil exploration and development, ORV use in the play area west of Worland, locatable mineral exploration, and salable mineral development would be the same as that described under the Preferred Alternative.

Cumulative sheet and rill erosion for the activities cited above would be about 303,900 tons per year under Alternative A. When gully and streambank erosion and natural erosion are added, the total erosion would be about 4,662,700 tons per year by the end of the analysis period. The amount of erosion delivered to streams would be about 466,300 tons per year representing an 1 percent decrease from 1990 levels of erosion and stream sediment yield. Most of this decrease would be associated with the accomplishment of desired plant community objectives, the use of forage utilization objectives, and improvements in riparian functioning condition.

The effects of produced water discharges to surface waterways would be the same as those described for the Preferred Alternative. For example, the anticipated increased use of water reinjection wells and water floods and the shutting in of marginally profitable wells would cause a decline in the volume of produced water discharged to the planning area. This would decrease salt concentrations and other pollutants in receiving waters and lead to an improvement in water quality during the analysis period; however, wetland and riparian areas

would continue to receive less water, reducing the water available to livestock and wildlife.

Vegetation

Forestland Vegetation

As in the Preferred Alternative, woodland encroachment would continue; woodlands would increase to about 48,000 acres under current management.

The continuation of current management would not change the acres of commercial forestland in the planning area, although the land available for timber harvesting could be reduced by review of the timber production capability classification (as in the Preferred Alternative).

Under Alternative A, the acreage of the various forest types, other than aspen and woodlands, would not change significantly. Overall, the number of acres producing aspen stands would triple; woodlands would expand by about 7 percent. The acreage of young commercial forests would increase by 14 percent. Mature forests would be generally unchanged and overmature/old growth forests would decline by 11 percent. About 85 percent of the commercial forestland would be mature or overmature at the end of the analysis period. As in the Preferred Alternative, declines in forest structural diversity, and associated wildlife habitat and biological diversity, would be significant.

Rangeland Vegetation

There would be no anticipated effects on plants that are candidates for threatened or endangered listing, or on other special status vegetation.

The use of prescribed fire during the analysis period would increase grass production by 1.8 million pounds in the areas treated, half as much as in the Preferred Alternative. Generally, loamy range sites in the 10- to 14-inch and 15- to 19-inch precipitation zones would be affected.

Management actions under this alternative would have the following effect on rangeland condition: By the year 2005, an estimated 62 allotments would have an upward trend on about 70,800. As with the Preferred Alternative, vegetative trend on the remaining allotments would be static, and declining trend associated with livestock grazing would be largely eliminated.

In the wild horse herd area, grazing utilization would vary from 35 to 60 percent of the available forage and, locally, vegetation could be adversely affected by not completing its growth during the year, or not replenishing root reserves needed for subsequent years. However, in most of the herd area, forage utilization would not exceed 35 percent. This is based partly on Alternative A's forage allocations in the herd area, comprising 2,300 AUMs annually to wild horses and a maximum of 3,370 AUMs annually to livestock. Vegetative trend in the herd area would continue to be static.

About 295,000 acres in basin grassland/shrub communities would be managed for deer, pronghorn antelope, and sage grouse habitat. Sagebrush would be managed as an important component of these habitats. Treatments to reduce sagebrush would be infrequent.

The foothills-mountain grassland/shrub community (108,700 acres) has the highest productivity and sagebrush density of all lands characterized by sagebrush. Furthermore, encroachments of limber pine and juniper are occurring on these sites. Consequently, vegetation treatments using prescribed fire are important in this plant community to maintain forage for livestock. The sagebrush on about 28,000 acres of this community is identified as important for wildlife habitat, under Alternative A. On these 28,000 acres (comprising 26 percent of the community) the use of prescribed fire and chemical treatments would be restricted causing shrubs, limber pine, and juniper to increase.

In Alternative A, no significant effects on rangeland vegetation would be anticipated from the management of air quality, minerals, cultural, paleontological and natural history resources, recreation, and visual resources. (Although in rare cases, the discovery of cultural or paleontological resources, or the management of highly scenic areas, could preclude some vegetative treatments.)

There would be no effect on vegetation from management actions in the Meeteetse Draw Rock Art area. In the Fifteenmile Creek watershed, environmental consequences would be associated with the accomplishment of desired plant community objectives and management actions for wild horses. Generally, vegetation trend and riparian functioning condition would improve.

Riparian Function. Based on the anticipated development of allotment management plans and the accomplishment of desired plant community objectives, it is anticipated that by the year 2005 properly-functioning riparian areas on public land would increase from 1,140 to 1,290 acres; functioning-at-risk riparian areas having upward trends would increase from 240 to 400 acres, while those having downward trends would decrease from 610 to 370 acres; and nonfunctioning riparian areas would decrease from 270 to 200 acres. Planning areawide, the total acres of riparian areas on public lands would remain at about 2,260, or would increase slightly. Slightly larger riparian areas would result from improvements in riparian function that allow water tables to rise.

Under Alternative A those riparian areas with designated moose crucial winter range, moose calving habitat, and deer crucial winter range generally would develop shrub and deciduous tree communities representing a high level of biological diversity on 1,600 acres (71 percent) of public land riparian areas. Desired plant communities have also been established for sage grouse habitat which emphasize shrub communities. In all other riparian areas properly-functioning condition would be achieved with more herbaceous vegetation. These areas would not provide the same level of biological diversity.

Woody riparian vegetation would be emphasized through desired plant community objective on approximately 1,600 acres (82 percent) of the planning area riparian acreage where deer and moose critical winter ranges occur.

Wild Horses

Acquisition of an estimated 12,000 acres of private lands in the herd area through exchange would be pursued. If an exchange took place it would improve BLM's management of the wild horses and there would be potential for the development of at least one new water source. This would improve wild horse and wildlife distribution within the area.

As in the Preferred Alternative access to the herd area would be improved, creating new opportunities for the public to view wild horses. Under Alternative A, the size of the herd area would not be increased and wild horses would continue to occupy their preferred habitat areas near Tatman Mountain. Generally, wild horse forage and dietary requirements would be satisfied by the accomplishment of forage utilization and desired plant community objectives, as in the Preferred Alternative. Genetic viability of the herd would be maintained by keeping from 70 to 160 adult horses in and near the herd area.

Wildlife and Fish

Wildlife Habitat

The use of prescribed fire on 4,500 acres during the analysis period would improve habitat for elk, moose, and mule deer, but not as much as under the Preferred Alternative.

Timber harvests would decrease thermal and hiding cover for big game by up to 1,900 acres but would also increase aspen stands and associated forage on up to 400 acres during the analysis period. The other effects of forest management would be the same as those described for the Preferred Alternative.

The effects of increased public access in the Absaroka Mountain foothills would be the same as those described for the Preferred Alternative.

The effects of landownership adjustments and rights-of-way construction would be the same as those described for the Preferred Alternative.

The effects of restrictions on livestock grazing would be similar to those described for the Preferred Alternative. Because of higher forage utilization objectives, slightly less forage would be available for mule deer and pronghorn antelope in Salt Desert Shrub and Salt Bottom environments. Woody riparian vegetation would increase in winter habitat areas for mule deer and moose, but on fewer acres than under the Preferred Alternative.

The effects of surface-disturbing activities, including gas and oil development, would be similar to those described for the Preferred Alternative. However, fewer acres would be protected in the Upper Owl Creek area, where surface disturbance would be prohibited at Castle Rocks, Mudstone Ridge, and the Holy City. In these areas, about 3,900 acres of elk crucial winter habitat and 1,400 acres of bighorn sheep winter habitat would be protected from all surface-disturbing activities. Overall, habitat security would be maintained on all important big game use areas. Seasonal and "no surface disturbance" restrictions would maintain habitat security in sage grouse strutting, breeding, and nesting areas.

The effects of exploration and development activities for locatable and salable minerals would be the same as those described for the Preferred Alternative.

The effects of off-road vehicle limitations would be similar to those described for the Preferred Alternative. However, Alternative A would have slightly greater adverse effects because the Badlands would be open to more vehicle use, on existing roads and trails. Generally, the effects would be reduction of habitat security for mule deer and pronghorn antelope.

Under Alternative A, vegetation management using desired plant community objectives would maintain necessary forage for big game on crucial winter ranges and some birthing areas and maintain habitat for sage grouse strutting, breeding, and nesting. Elk and pronghorn antelope birthing areas would lack specific vegetative community objectives. Habitat quality and diversity would be improved compared to 1990, but not as much as in the Preferred Alternative.

The effects of wild horse management would be the same as those described for the Preferred Alternative.

Threatened and Endangered Wildlife Species. There would be no significant effect on known or potential

threatened, endangered, or sensitive wildlife or fish species in the planning area, including bald eagles, grizzly bears, wolves, peregrine falcons, or black-footed ferrets.

Fish Habitat

Under Alternative A, sedimentation contributed by watercourses on public lands within the planning area would decrease 1 percent, slightly improving game fish habitat in the Bighorn River and the nongame fish species habitat in tributaries of the river.

With the continuation of current management, 1.6 miles of stream would improve from nonfunctioning condition to functioning-at-risk condition; and 10.1 miles of stream would improve from functioning-at-risk to properly functioning, on public land streams containing fish. This would directly benefit the game and nongame fish habitat on 11.7 miles of public land streams.

Alternative A Summary

Under this alternative, the public would have more opportunities to learn about cultural and historic resources. The management and protection of ACECs would not be emphasized.

As in the Preferred Alternative, overall forest structural diversity and associated biological diversity would decline, as forests grow older.

Genetic diversity would be maintained in the Fifteenmile Creek wild horse herd. Horse management would be improved through land exchanges or cooperative agreements and the public would have more opportunities for viewing wild horses. However, management capability would be hindered because horses would continue to use some lands outside the existing herd area.

Recreational use would increase moderately under this alternative and authorized livestock grazing would decrease moderately. As in the other alternatives, the amount of new exploration for gas and oil would decline slightly during the analysis period.

This alternative would provide a moderate level of habitat security for wildlife and somewhat increased biological diversity.

ALTERNATIVE B

Effects on Land Uses and Resources

Air

The effects on air quality of proposed management actions in Alternative B would be the same as those described for the Preferred Alternative.

Cultural, Paleontological, and Natural History Resources

Under Alternative B, the effects on cultural, paleontological, and natural history resources would be similar to those described for Alternative A; however, Alternative B would have less emphasis on management of rock art at Meeteetse Draw for public education.

Under Alternative B, more emphasis would be placed on facilitating cultural resource inventories in advance of proposed surface-disturbing activities. During the analysis period, these inventories would identify a greater number of important cultural resource sites, compared to the Preferred Alternative and Alternative A. No significant adverse effects would occur to these cultural resources.

Livestock Grazing

Under Alternative B, forage available for livestock grazing would decrease from the 1990 authorized grazing use of 157,355 by 28 percent, or about 43,815 AUMs, during the analysis period. This decrease to 113,540 AUMs means that available forage would be less than the 1990 average actual use, but greater than the average actual use during 1976 through 1980 and 1987 through 1991.

Assuming a similar 28 percent decrease in forage availability on public lands, the level of active preference would be changed from the 1990 level of 101,451 AUMs, to an anticipated level of 73,000 AUMs, by the end of the analysis period.

Minerals

Coal

The effects on coal development would be the same those described for the Preferred Alternative.

Gas and Oil

"No surface occupancy" (NSO) constraints on new gas and oil leasing would apply to about 360 acres of BLM-administered mineral estate having high potential for gas and oil occurrence at the Legend Rock Petroglyph Site. No adverse effects on development are anticipated from these constraints because the lands could be directionally drilled.

Controlled surface use constraints would be applied on landfills and shooting ranges affecting about 480 acres of BLM-administered mineral estate having high potential for gas and oil occurrence. Gas or oil on these lands could be developed through directional techniques.

Timing limitations would be used to protect big game animals on overlapping winter ranges, birthing areas, and migration corridors. These would affect about 26,745 acres of BLM-administered mineral estate having high potential for gas and oil occurrence, 32,620 acres with moderate potential, and 9,735 acres with low potential. These limitations could prohibit exploratory drilling from six to eight months during the year but would only be used when big game animals are present and cannot use adjacent lands. It is anticipated that winter and spring weather conditions would require use of these constraints during portions of about 10 to 12 years during the analysis period.

About 1,101,060 acres of BLM-administered mineral estate would be leased with standard terms and conditions.

The number of exploratory wells drilled under this alternative (15) would be the same as in the Preferred Alternative, although costs could be slightly lower because the need for directional drilling would be less.

Locatable Minerals

There would be no adverse effects on locatable mineral exploration and development under Alternative B. The effects on locatable minerals development would be the same as in the Preferred Alternative for lands on which coal and phosphate classifications would be terminated.

Salable Minerals

There would be no adverse effects on salable mineral exploration and development under Alternative B. Planning areawide, sand and gravel, moss rock, and other mineral materials could be sold on demand following site-specific environmental analyses. As in the Preferred Alternative, the area within 0.5 mile of the Legend Rock Petroglyph Site would be closed to the development of mineral materials; however, no existing gravel pits are located within this radius. Compared to Alternative A, sand and gravel could be mined from the two existing pits within 3 miles of the petroglyph area. These pits would continue to meet local demand for sand and gravel.

Recreation

Under this alternative, recreational use on planning area public lands would increase by 40 percent.

Tables 15 and 18 show the anticipated recreational use on public lands in the planning area for Alternative B, at the end of the analysis period.

Like the Preferred Alternative and Alternative A, a moderate increase of recreational use would take place in the Absaroka Mountain foothills, in the Badlands, along the Bighorn River, and in the Meeteetse Draw area. However, the types of recreation in these areas would change compared to those alternatives. In particular, recreational activities that depend on motor vehicle access would increase.

Additional vehicle access would be pursued to national forest trailheads and off-road vehicle restrictions would be eased. Hiking, photography, wildlife watching, and hunting would increase. In the Badlands, driving, sightseeing, and camping would increase, as would fishing at Wardel Reservoir because day-use facilities would be developed. As in the Preferred Alternative and Alternative A, the use of interpretive signs would increase recreational use in the Meeteetse Draw area.

The development of vehicle access in the Red Canyon Creek area and the establishment of two ORV play areas would increase use in these areas considerably. The ORV play areas would focus off-road vehicle use near Worland and Basin. Compared to the Preferred Alternative and Alternative A, this would further reduce off-road driving adjacent to the play areas; however, off-road driving would increase in the Red Canyon Creek area.

Another large increase in recreational use would take place near the Gebo historic coal mining area, similar to that of the Preferred Alternative, especially if an interpretive driving loop is developed.

Compared to Alternative A, nonconsumptive recreational uses like driving, sightseeing, and camping would increase under this alternative because of the improved road access and fewer limitations on off-road vehicle use. Road access would be enhanced by construction related to gas and oil exploration and development, timber harvest, and rights-of-way development.

Socioeconomics

During the years 1991 through 2005, the land and resource uses taking place on all lands in the planning area would impact the local economy by the expenditure of $4,018,355,907 under Alternative B.

Land and resource uses taking place on just BLM-administered lands would contribute $2,502,145,165 to the local economy during the same period.

Timber harvesting on all lands in the planning area would impact the local economy by the expenditure of $29,590,715 under Alternative B. This contribution would be about 12 percent greater than that of Alternative A.

On public lands, timber harvests would contribute $7,109,458 during the analysis period, being about 76 percent greater than Alternative A.

Livestock grazing on all lands in the planning area would impact the local economy by the expenditure of $140,710,482 under Alternative B. This contribution would be about 1 percent greater than that of Alternative A.

On public lands, livestock grazing would contribute $99,792,446, again being about 1 percent more than that of Alternative A.

The socioeconomic effects of coal, gas, and oil development are the same as those described for the Preferred Alternative.

Recreation on all lands in the planning area would impact the local economy by the expenditure of $124,405,320 under Alternative B. This contribution would be about 6 percent greater than that of Alternative A.

On public lands, recreation would contribute $29,092,605 during the analysis period, being about 7 percent more than Alternative A.

Recreation's beneficial impact on the local economy under this alternative would also be greater than that of Alternative A for personal income and employment. Overall, Alternative B's impacts from recreation are more beneficial than those of Alternative A, but less beneficial than those of the Preferred Alternative and Alternative C.

Soils and Water

Annual soil loss from prescribed fire would be the same as that described for the Preferred Alternative (900 tons per year) and double that of Alternative A. Soil loss from wildfire would be the same as in both those alternatives.

Annual soil loss from timber harvesting would be about 1,070 tons per year. Based on anticipated rights-of-way development under this alternative, soil losses would be as high as 1,000 ton per year.

Meeting objectives for livestock utilization or changing the season of use to winter in Salt Desert Shrub and Salt Bottom communities would reduce sheet and rill erosion to 256,900 tons per year associated with grazing.

The effects on soil erosion from minerals exploration and development would be the same as in the previously described alternatives. An off-road vehicle play area would be developed west of Basin in addition to the one near Worland. Soil erosion from these two sites would be about 27,200 tons per year.

Cumulative sheet and rill erosion for the activities cited above would be about 294,900 tons per year under this alternative. When gully and streambank erosion and natural erosion are added, the total erosion would be about 4,621,900 tons per year by the end of the analysis period. The amount of erosion delivered to streams would be about 462,200 tons per year representing a 2 percent decrease from 1990 levels of erosion and stream sediment yield.

The effects on water quality from the discharge of water produced by gas and oil development would be the same as those described in the Preferred Alternative and Alternative A.

Vegetation

Forestland Vegetation

Woodland encroachment would continue under this alternative at the rate described for the Preferred Alternative. Compared to Alternative A, woodlands would occupy 500 fewer acres at the end of the analysis period.

Overall, the number of acres having aspen would increase by 150 percent compared to the 1990 base year; woodlands would expand by about 1 percent. The acreage of young commercial forests would increase by 68 percent. Mature forests would decline by 9 percent and overmature/old growth forests would decline by 26 percent. About 77 percent of the commercial forestland would be mature or overmature at the end of the analysis period.

Forest health and structure would be less of a problem under this alternative, compared to the other alternatives. Young stands created by silviculture treatments would be healthier and produce more wood; insect and disease problems would be reduced. The forest landscape would more closely resemble a presettlement appearance.

Rangeland Vegetation

There would be no anticipated effects on plants that are candidates for threatened or endangered listing, or on other special status vegetation.

The general effects of wildfire, and vegetation management from chemical spraying and the use of prescribed fire, would be the same as those described for the Preferred Alternative (that is, 3.6 million pounds of grass would be produced as a result during the analysis period).

Management actions under this alternative would have the following effect on rangeland condition: By the year 2005, an estimated 67 allotments would have an upward trend on about 71,700 acres. Vegetative trend on the remaining allotments would be static. As in the other alternatives, declining trend associated with livestock grazing would be largely eliminated.

In this alternative, specific forage allocations would not be made to livestock in the wild horse herd area. Initial livestock active preference would remain at 7,685 AUMs per year. Past actual grazing use has been 11 percent of active preference and vegetative condition has remained static. However, in this alternative, livestock use in the herd area is anticipated to increase. Livestock grazing in the absence of the wild horses would be implemented under the standards specified in the alternative and vegetative trend would change from static to upward.

Desired plant community objectives to benefit wildlife habitat would apply only to elk crucial winter ranges. In these areas prescribed fire or mechanical methods would be used to reduce sagebrush, limber pine, and juniper to allow for grass production. Lands in the foothills-mountain grassland/shrub vegetative community would be affected. (See the Livestock Grazing section of this chapter for related effects.)

In Alternative B, no significant effects on rangeland vegetation would be anticipated from the management of air quality, minerals, cultural, paleontological and natural history resources, recreation, and visual resources.

There would be no effect on vegetation from management actions in the Meeteetse Draw Rock Art area. In the Fifteenmile Creek watershed vegetation trend and riparian functioning condition would improve.

Riparian Function. The functioning condition of riparian vegetation would be the same in Alternative B as in Alternative A. Compared to Alternative A, the desired community objectives of this alternative would have less emphasis on the establishment of shrubs and deciduous trees in riparian areas and a greater emphasis on herbaceous vegetation. Overall, this would result in a lower level of biological diversity. This would be particularly true in the wild horse herd area because livestock would replace wild horses that make light use of riparian vegetation.

Wild Horses

In this alternative, all horses would be removed from the planning area. Opportunities for the public to view wild horses would be lost. Because there would be no objectives for wild horse management, land exchanges identified in the other alternatives would not be pursued. By not exchanging lands, acquisition of public easements along Badger Gulch would be necessary to meet recreation and livestock grazing management objectives.

The lack of wild horses would facilitate the conversion of livestock grazing from sheep to cattle, where appropriate, and these requests would be considered individually. If all existing sheep use were converted to cattle, at a ratio of seven sheep for each cow AUM, the total number of AUMs that could be grazed in the herd area would be about 5,560 annually. This is roughly the total recommended stocking rate of the area, as indicated by the rangeland vegetation inventory. This means that demand for cattle grazing in the herd area could be accommodated at the currently authorized AUM levels.

Wildlife and Fish

Wildlife Habitat

As in the Preferred Alternative, the use of prescribed fire on 9,000 acres would improve habitat for elk, moose, and mule deer. However, this alternative's emphasis on livestock forage production would allow sagebrush to be burned in crucial winter areas for mule deer and pronghorn antelope, and in sage grouse nesting areas. In some areas, forage may not be available during severe winters or during nesting periods to support existing wildlife numbers.

Timber harvests would decrease thermal and hiding cover for big game by up to 2,250 acres but would also increase aspen stands and associated forage on up to 300 acres during the analysis period. Use of the area by wildlife would be about the same as in the Preferred Alternative and Alternative A, except more thermal and hiding cover would be lost. Also, use of habitat by big game would be decreased where timber roads are kept open for vehicle access instead of being reclaimed. Habitat within 0.5 mile of these roads would be affected. Under Alternative B, there would be increased potential

for loss of habitat along desert waterways because firewood harvesting would be allowed. The other effects of forest management actions would be the same as those described for the Preferred Alternative and Alternative A.

Compared to the other alternatives, public access in the Absaroka Mountain foothills, including vehicle access, would increase at a higher rate. There would also be no specific provisions for applying seasonal restrictions on this access. The areas affected provide calving and summer habitat for elk, moose, and deer. There would be increased potential for displacement and separation of doe/fawn or cow/calf groups during the months of May and June. Increased human activity would also take place during hunting season when the animals are beginning to move to their wintering areas. This would reduce the animals' energy reserves, causing greater mortality during the winter and decreasing reproductive success the following spring.

Under Alternative B, BLM would not pursue consolidation of seasonal habitat areas on isolated tracts or attempt to acquire important wetland/riparian areas. This would result in habitat fragmentation if private lands are developed without consideration for larger habitat areas. Wildlife would move from developed areas causing higher stress levels which could decrease wildlife populations.

The effects of rights-of-way construction would be the same as those described for the Preferred Alternative.

Under Alternative B, there would be minimal restrictions on livestock grazing to protect wildlife habitat. However, areawide forage utilization objectives for livestock would be the same as those in the Preferred Alternative. The primary benefit of these objectives would be increased forage in Salt Desert Shrub and Salt Bottom environments for mule deer and pronghorn antelope. Compared to the other alternatives and the existing (1990) situation, woody riparian vegetation would decrease, reducing mule deer and moose habitat along streams. But, as with the other alternatives, wetland/riparian areas would be fenced to exclude livestock grazing, if they contribute to biological diversity by containing important or significant wildlife habitats.

Under this alternative, seasonal restrictions on surface-disturbing activities would only apply to important moose, elk, and bighorn sheep habitat and there would be no prohibitions on surface-disturbing activities within 0.5 mile of the Bighorn River.

The effects of exploration and development activities for locatable and salable minerals would be similar to those described for the Preferred Alternative. By allowing salable mineral development within 0.5 mile of the Bighorn River, habitat security for waterfowl, raptors, song birds, and white-tailed deer would be reduced on about 40 acres. If gravel terraces above the river are mined, habitat security would be reduced in pronghorn antelope fawning areas, because Alternative B would not include seasonal limitations here.

The effects of off-road vehicle limitations would be similar to those described for Alternative A. However, Alternative B would have slightly greater adverse effects because larger portions of the Absaroka foothills and the all the Badlands would be open to vehicle use, on existing roads and trails. Generally, the effects would be reduction of habitat security for elk, mule deer, and pronghorn antelope. The establishment of an additional off-road vehicle play area near the town of Basin could disrupt pronghorn fawning during the spring, reducing reproductive success by 20 percent.

Under Alternative B, vegetation management using desired plant community objectives would maintain necessary forage for wildlife on elk crucial winter ranges and moose crucial winter and calving areas. Other habitat areas would have no specific objectives for vegetative communities. Compared to the 1990 base year, habitat quality and diversity would improve slightly for some big game winter and birthing areas, and for sage grouse habitat. The improvement in sage grouse habitat would exceed that of Alternative A by the end of the analysis period. All other habitats would improve less under Alternative B than under the other alternatives.

Under Alternative B wild horses would not be kept in the planning area and domestic sheep grazing in the wild horse herd area could be converted to cattle grazing. Compared to the other alternatives, cattle would compete less for forage with pronghorn antelope. This would improve the quality of pronghorn winter habitat on 40,500 acres.

Threatened and Endangered Wildlife Species. There would be no significant effect on known or potential threatened, endangered, or sensitive wildlife or fish species in the planning area, including bald eagles, grizzly bears, wolves, peregrine falcons, or black-footed ferrets.

Fish Habitat

Under Alternative B, sedimentation contributed by watercourses on public lands within the planning area would decrease 2 percent, slightly improving game fish habitat in the Bighorn River and the nongame fish habitat in the tributaries of the river.

The effects on fish habitat from riparian condition and channel stability would be the same as those described for Alternative A.

Alternative B Summary

Under this alternative, the public would have more opportunities to learn about cultural and historic resources. The management and protection of ACECs would not be emphasized.

This alternative would have the greatest improvement in structural diversity and overall forest health, because mature and overmature stands would be harvested to a greater extent. Biological diversity in these forests would increase.

The public would lose existing opportunities to view wild horses with transfer of the horses out of the planning area. Conflicts with horse use on private land would end and the herd area would become available for cattle grazing.

Recreational use would increase moderately under this alternative but more than under Alternative A. Authorized livestock grazing would decrease less than in the other alternatives. As in the other alternatives, the amount of new exploration for gas and oil would decline slightly during the analysis period.

This alternative would provide the least amount of habitat security for wildlife and the lowest potential for increased biological diversity except in forest habitats.

ALTERNATIVE C

Effects on Land Uses and Resources

Air

The effects on air quality of proposed management actions in Alternative C would be the same as those described for the Preferred Alternative.

Cultural, Paleontological, and Natural History Resources

Under Alternative C, the effects on cultural, paleontological, and natural history resources would be the same as those described for the Preferred Alternative.

Livestock Grazing

Under Alternative C, forage available for livestock grazing would decrease from the 1990 authorized grazing use of 157,355 by 47 percent, or about 73,205 AUMs, during the analysis period. This decrease to 84,150 AUMs means that available forage would be less than the 1990 average actual use and the average actual use during 1976-1980 and 1987-1991.

Assuming a similar 47 percent decrease in forage availability on public lands, the level of active preference would be changed from the 1990 level of 101,451 AUMs, to an anticipated level of about 54,000 AUMs, by the end of the analysis period.

Minerals

Coal

The effects on coal development would be the same as those described for the Preferred Alternative.

Gas and Oil

"No surface occupancy" (NSO) constraints on new gas and oil leasing would apply to about 48,435 acres of BLM-administered mineral estate having high potential for gas and oil occurrence, 56,025 acres with moderate potential, and 22,365 acres with low potential. Most of these constraints would protect scenic values, wildlife habitat, and soil and water in the Absaroka Mountain foothills. Exploratory drilling on volcanic rocks in the Absaroka Foothills would shift to the eastern part of the area because of NSO constraints. However, it is anticipated that the same number of exploratory wells would be drilled in the Sub-Absaroka and adjacent Basin-Margin Anticline plays, as in the other alternatives.

Controlled surface use constraints in this alternative would affect fewer lands than under the Preferred Alternative and Alternative A. Most would be applied in sage grouse habitat complex areas. About 40,965 acres of BLM-administered mineral estate having high potential for gas and oil occurrence and 33,300 acres with moderate potential would be affected. The effects of the controlled surface use constraints to protect sage grouse complex areas are the same as those described for the Preferred Alternative.

Timing limitations would be used to protect mule deer and pronghorn antelope on winter ranges and pronghorn fawning areas. These would affect about 208,590 acres of BLM-administered mineral estate having high potential for gas and oil occurrence and 149,625 acres with moderate potential. These limitations could prohibit exploratory drilling from two to six months during the year but would only be used when big game animals are present and cannot use adjacent lands. Winter and spring weather conditions would require use of these constraints during portions of about three to five years during the analysis period.

About 611,700 acres of BLM-administered mineral estate would be leased with standard terms and conditions.

The number of exploratory wells drilled under this alternative (15) would be the same as in the Preferred Alternative, although costs could be higher because of a potential greater need for directional drilling.

Locatable Minerals

The effects on locatable minerals development would be the same as those described for the Preferred Alternative.

Salable Minerals

The effects on salable minerals development would be the same as those described for Alternative A, for the vicinity of the Legend Rock Petroglyph Site, and the same as in the Preferred Alternative, otherwise.

Recreation

The effects of Alternative C on recreation would be the same as those described for the Preferred Alternative.

Socioeconomics

During the years 1991 through 2005, the land and resource uses taking place on all lands in the planning area would impact the local economy by the expenditure of $4,001,340,859 under Alternative C.

Land and resource uses taking place on just BLM-administered lands would contribute $2,486,854,340 to the local economy during the same period.

Timber harvesting on all lands in the planning area would impact the local economy by the expenditure of $24,979,175 under Alternative C. This contribution would be about 6 percent greater than that of Alternative A.

On public lands, timber harvests would contribute $2,497,918 during the analysis period, being about 38 percent less than Alternative A.

Livestock grazing on all lands in the planning area would impact the local economy by the expenditure of $122,580,379 under Alternative C. This contribution would be about 12 percent less than that of Alternative A.

On public lands, livestock grazing would contribute $88,071,728 during the analysis period, being about 11 percent less than Alternative A.

The socioeconomic effects of coal, gas, and oil development are the same as those described for the Preferred Alternative.

Recreation on all lands in the planning area would impact the local economy by the expenditure of $130,131,915 under Alternative C. As with the Preferred Alternative, this contribution would be about 11 percent greater than that of Alternative A.

On public lands, recreation would contribute $30,134,040 during the analysis period. Again this would be the same as the Preferred Alternative.

Recreation's beneficial impact on the local economy under this alternative would also be greater than that of Alternatives A and B for personal income and employment.

Soils and Water

The soil erosion from wild and prescribed fire would be the same as in Alternative A.

Annual soil loss from timber harvesting would be about 590 tons per year. Based on anticipated rights-of-way development under this alternative, soil losses would be as high as 800 ton per year.

Meeting objectives for livestock utilization or changing the season of use to winter in Salt Desert Shrub and Salt Bottom communities, and further limiting utilization elsewhere would reduce sheet and rill erosion to about 235,300 tons per year.

The effects on soil erosion from minerals exploration and development would be the same as in the other three alternatives. Soil loss from sheet and rill erosion from the proposed Worland ORV play area would be the same as in the Preferred Alternative and Alternative A.

Cumulative sheet and rill erosion for the activities cited above would be about 257,600 tons per year. When gully and streambank erosion and natural erosion are added, the total erosion would be about 4,556,700 tons per year by the end of the analysis period. The amount of this erosion delivered to streams would be about 455,700 tons per year representing an 3 percent decrease from 1990 levels of erosion and stream sediment yield.

The effects on water quality from the discharge of water produced by gas and oil development would be the same as in the other alternatives.

Vegetation

Forestland Vegetation

Under Alternative C, the number of acres having aspen would increase by 50 percent; woodlands would expand by about 6 percent, compared to the 1990 base year. The acreage of young commercial forests would be unchanged. The acres of mature forests would increase by 4 percent and overmature/old growth forests would increase by 21 percent. About 86 percent of the commercial forestland would be mature or overmature at the end of the analysis period.

Compared to the Preferred Alternative, forest health and diversity would decline. There would be no significant change in the acreage of young stands during the analysis period. The forest would be at a greater risk to problems like insect infestations, disease, and declining diversity as mature and old growth stands increase.

Rangeland Vegetation

There would be no anticipated effects on plants that are candidates for threatened or endangered listing, or on other special status vegetation.

The general effects of wildfire and vegetation treatments would be the same as those described for Alternative A.

Management actions under this alternative would have the following effect on rangeland condition: By the year 2005, an estimated 114 allotments would have an upward trend on about 89,600 acres. Vegetative trend on the remaining allotments would be static. As in the other alternatives, declining trend associated with livestock grazing would be largely eliminated.

The effects on vegetation from wild horses would be the same as in the Preferred Alternative. Although the herd area would be expanded, this would not change the present distribution of the horses, which use the Tatman Mountain area north of the existing herd area. Forage use allocated to domestic livestock in the expanded herd area would insure that overall forage utilization did not exceed 35 percent, and vegetative condition would remain static or would improve.

About 395,000 acres in basin grassland/shrub communities would be managed for deer, pronghorn antelope, and sage grouse habitat. Sagebrush would be managed as an important component of these habitats. Treatments to reduce sagebrush would be infrequent.

As discussed in the Preferred Alternative consequences, the foothills-mountain grassland/shrub community (108,700 acres) has high vegetative productivity and is important for both livestock grazing and wildlife habitat. However, the use of fire to reduce sagebrush, limber pine, and juniper to improve livestock grazing forage would be restricted on about 76,000 acres (70 percent) of this plant community, under Alternative C.

In Alternative C, no significant effects on rangeland vegetation would be anticipated from the management of air quality, minerals, cultural, paleontological and natural history resources, recreation, and visual resources.

There would be no effect on vegetation from management actions in the Meeteetse Draw Rock Art Proposed ACEC. The effects of management in the Fifteenmile Creek Watershed Proposed ACEC would improve as in Alternative A but more rapidly.

Riparian Function. Based on the anticipated development of allotment management plans and the accomplishment of desired plant community objectives, it is anticipated that by the year 2005 properly-functioning riparian areas on public land would increase from 1,140 to 1,390 acres; functioning-at-risk riparian areas having upward trends would increase from 240 to 430 acres, while those having downward trends would decrease from 610 to 290 acres; and nonfunctioning riparian areas would decrease from 270 to 150 acres. Planning areawide, the total acres of riparian areas on public lands would remain at about 2,260, or would increase slightly.

Under Alternative C, woody riparian vegetation would be emphasized through desired plant community objectives on approximately 1,650 acres (73%) of the public land riparian areas on deer and moose winter and crucial winter ranges and on sage grouse habitat. These area generally would develop shrub and deciduous tree communities representing a high level of biological diversity. In all other riparian areas properly-functioning condition would be achieved with more herbaceous vegetation. These areas would not provide the same level of biological diversity.

Wild Horses

The effects of management actions under this alternative would be the same as those described for the Preferred Alternative.

Wildlife and Fish

Wildlife Habitat

As with Alternative A, the use of prescribed fire on 4,500 acres during the analysis period would improve habitat for elk, moose, and mule deer, but not as much as under the Preferred Alternative.

Under Alternative C, forest management practices would maintain or increase wildlife thermal and hiding cover. Habitat and forage values associated with aspen stands would increase on 100 acres. Wildlife use of forest management areas would be about the same as in the Preferred Alternative and Alternative A. As in those two alternatives, habitat associated with desert cottonwood trees would be maintained because firewood cutting would be prohibited.

The effects of increased public access in the Absaroka Mountain foothills would be the same as those described for the Preferred Alternative.

The effects of landownership adjustments would be similar to those described for the Preferred Alternative. However, additional protection would be provided by maintaining blocks of wildlife habitat, based on this alternative's emphasis on land exchange (rather than sale), and on the provision for no net loss of crucial wildlife habitat.

The effects of rights-of-way construction would be similar to those described for the Preferred Alternative. However, protection of important wildlife habitat areas would be provided by the designation of additional rights-of-way avoidance areas in Alternative C. Although construction would not be prohibited in these areas, potential adverse effects on wildlife would require intensive mitigation. The overall effect would be fewer rights-of-way constructed and fewer human disturbances of wildlife.

The effects of restrictions on livestock grazing would be similar to those described for the Preferred Alternative. Generally, however, habitat security would improve and habitat areas would expand compared to the Preferred Alternative. Alternative C's emphasis on improving both crucial and noncrucial big game habitats would ensure that animals remain dispersed during mild winters and would not overuse crucial habitat. As a result, these crucial winter ranges would provide additional security for animals when needed for severe winter conditions. By prohibiting domestic sheep grazing within 20 miles of existing bighorn sheep habitat, the potential for the spread of disease would be eliminated. The bighorn sheep population would eventually expand to fill all available habitat.

Under Alternative C, about 68,000 acres of public land within the Absaroka Mountain foothills would be protected from all surface-disturbing activities. These lands would include all the important elk, moose, and bighorn sheep habitat in the planning area. The lands include those where surface-disturbances would be prohibited under the Preferred Alternative, plus those where "controlled surface use" restrictions would be applied to gas and oil leasing in that alternative. Habitat security would be increased on all important big game areas and maintained in waterfowl, raptor, song bird, and white-tailed deer habitats along the Bighorn River.

Seasonal and "controlled surface disturbance" restrictions would maintain habitat security in sage grouse strutting, breeding, and nesting areas.

The effects of exploration and development activities for locatable and salable minerals would be the same as those described for the Preferred Alternative.

The effects of off-road vehicle limitations would be the same as those described for the Preferred Alternative.

Under Alternative C, vegetation management using desired plant community objectives would maintain necessary forage for big game on all winter, crucial winter, and birthing habitat areas; and maintain habitat for sage grouse strutting, breeding, and nesting.

The effects of wild horse management would be the same as those described for the Preferred Alternative.

Threatened and Endangered Wildlife Species. There would be no significant effect on known or potential threatened, endangered, or sensitive wildlife or fish species in the planning area, including bald eagles, grizzly bears, wolves, peregrine falcons, or black-footed ferrets.

Fish Habitat

Under Alternative C, sedimentation contributed by watercourses on public lands within the planning area would decrease 3 percent, improving game fish habitat in the Bighorn River and the nongame fish habitat in the tributaries of the river.

With Alternative C's lower forage utilization objectives and emphasis on riparian habitat management using desired plant community objectives, 2.4 miles of stream would improve from nonfunctioning condition to functioning at-risk condition; and 16.2 miles of stream would improve from functioning-at-risk to properly functioning, on public land streams containing fish. This would directly benefit the game and nongame fish habitat on 18.6 miles of public land streams.

Alternative C Summary

Under this alternative, the public would have more opportunities to learn about cultural and historic resources. The management and protection of ACECs would be emphasized.

This alternative would have the greatest number of mature and overmature forests and reduced biological diversity in these areas.

Genetic diversity would be maintained in the Fifteenmile Creek wild horse herd. As in the Preferred Alternative, horse management would be improved through land exchanges or cooperative agreements, the public would have more opportunities for viewing wild horses, and a new management area boundary would include historic, preferred wild horse habitat.

This alternative would have the greatest increase in recreational use and the greatest decrease in authorized levels of livestock grazing. As in the other alternatives, the amount of new exploration for gas and oil would decline slightly during the analysis period.

This alternative would provide the greatest habitat security for wildlife and the highest potential for increased biological diversity planning areawide.

CHAPTER 5

CONSULTATION AND COORDINATION

INTRODUCTION

The Grass Creek RMP EIS was prepared by an interdisciplinary team of BLM specialists from the Grass Creek Resource Area, the Worland District, and the Wyoming State Office of the BLM. (See Table 23.) Reviews for accuracy and consistency were provided by both the district office and state office staffs.

TABLE 23
GRASS CREEK RMP LIST OF PREPARERS

NAME	TITLE	RESPONSIBILITY
Darrell Barnes	District Manager	Review
Joe Vessels	Area Manager	Review
Marian Atkins	Wildlife Biologist	Wildlife Habitat, Sensitive Plants
Brent Bestram	Geologist	Minerals Support
Gary Bingham	Fire Management Officer	Access, Fire
Buddy Borden	Economist, University of Wyoming	Socioeconomics
Jim Cagney	Supervisory Range Conservationist	Technical Coordination
Jerry Carter	Printing Management Specialist	Document Publication
Steve Christy	Forester	Forestry
JoDee Cole	Resource Information Specialist	Geographic Information System
Bob Fletcher	Economist, University of Wyoming	Socioeconomics
Bill Glover	Geologist	Minerals
Tamera Hammack	Printing Technician	Typesetting/Document Publication
Cam Henrichsen	Range Management Specialist	Wild Horses
Karen Hepp	Range Management Specialist	Livestock Grazing
Gretchen Hurley	Geologist	Minerals
Steve Kiracofe	Soil Scientist	Soils
Gene Leone	Outdoor Recreation Planner	Recreation
Patrick Madigan	Supervisory Cartographer	Cartography
Brett McCarty	Cartographic Technician	Map Digitizing
Terri Mitchell	Supervisory Cartography Technician	Cartography
Brett Moline	Economist, University of Wyoming	Socioeconomics
Sheri Morris	Printing Technician	Typesetting/Document Publication
Larry Neasloney	Cartography Technician	Cartography
Don Ogaard	Environmental Specialist	Minerals Support
Joe Patti	Field Planning Coordinator	Guidance and Technical Review
Bob Ross	Team Leader	Team Management, Writing
Carl Santmyer	Economist	Socioeconomics
Jamie Sellar-Baker	Natural Resource Specialist	Technical Coordination
Lucinda Smith	Physical Scientist	Air
Bruce Stevens	Range Technician	Wild Horses
Janine Terry	Public Affairs Officer	Public Participation, Editing
Margy Tidemann	Editorial Assistant	Editing/Formatting
Chet Wheeless	Fishery Biologist	Fish Habitat
John Whitehurst	Archaeologist	Cultural Resources, Paleontology
Bill Wilson	Hydrologist	Water

Consultation, coordination, and public involvement have occurred throughout the process through public meetings, informal meetings, individual contacts, news releases, and *Federal Register* notices.

Initial steps in the process began in 1992 with the development of a project charter (preparation plan). Other early efforts included research, inventory, analysis, and interagency coordination.

PUBLIC PARTICIPATION

A public participation plan was prepared to ensure that the public would have numerous opportunities to be actively involved in the planning and environmental process. Both formal and informal input have been encouraged and used.

A notice published in the *Federal Register* on October 19, 1991 indicated the intention of the BLM to prepare a resource management plan and requested information on coal and other specific resources. An open house was held on October 29 and 30, 1991 and seven people attended.

A scoping letter on 28 preliminary resource management concerns was mailed on November 25, 1991. Forty responses were received.

A scoping letter on planning criteria was mailed on March 4, 1992. Twenty-four responses were received.

A scoping letter on planning issues with an invitation to an open house was mailed on August 19, 1992. Twelve letters were received responding to the planning issues and 13 people attended the open house on September 23, 1992.

A special workshop was held for local government officials from Big Horn, Hot Springs, Park, and Washakie counties at the Worland District office on May 5 and 6, 1994. After a briefing on the progress of the document to that date, concerns, comments, and recommendations of the attendees were discussed and incorporated, if applicable.

Each operator of a grazing allotment has been contacted either in person or in writing to discuss the categorization of his or her allotment.

Formal and informal meetings have been held with many members of the ranching and minerals industries and with other interest groups and agencies. A summary of comments generated from these meetings is on file in the Grass Creek Resource Area office.

As part of the ongoing activity in consultation and coordination, the BLM is preparing a biological assessment of threatened and endangered species. Results of the assessment will be shared with the U.S. Fish and Wildlife Service as required by section 7 of the Endangered Species Act of 1973, as amended.

CONSISTENCY

Coordination with other agencies and consistency with other plans were accomplished through frequent communications and cooperative efforts between the BLM and involved federal, state, and local agencies and organizations.

The Wyoming Governor's Planning Office will be supplied with numerous copies of this draft document for review to ensure consistency with the state's ongoing plans. The RMP team has reviewed land use plans for Big Horn, Park, Hot Springs, and Washakie counties to ensure consistency. BLM personnel have met with the respective county planners and commissioners to promote greater understanding of goals, objectives, and resources of both the counties and the BLM.

AGENCIES AND ORGANIZATIONS CONSULTED

Members of the RMP EIS team have consulted formally or informally with numerous agencies, groups, and individuals during development of the plan. The following list is representative of the businesses, agencies, organizations, and individuals that have indicated an interest in the Grass Creek RMP and those that have been contacted during the planning process. This list is not inclusive. A complete list is on file at the Grass Creek Resource Area office.

Required Reviewers

Advisory Council on Historic Preservation, Washington, DC

Department of the Air Force
- HQ-US LEVX, Office of Env. Planning, Bolling AFB, Washington, DC
- Assistant Secretary of the Air Force, Install. Env. and Safety, Pentagon, Admiralty, VA

Department of the Army, Corps of Engineers, Omaha, NE

Department of Energy (EP-36), Washington, DC

Department of the Interior
- Bureau of Land Management, (760), Washington, DC
- Bureau of Land Management, Wyoming State Office, Cheyenne, WY
- Bureau of Mines, Mineral Data Analysis, Washington, DC
- Bureau of Reclamation, Division of Environmental Affairs, Washington, DC
- National Park Service, Division of Environmental Qual., Washington, DC
- U.S. Fish and Wildlife Service, Division of Environmental Coordination, Washington, DC
- U. S. Geological Survey, National Center, Reston, VA

Department of Transportation, Washington, DC
Federal Highway Administration, Washington, DC

Environmental Protection Agency, Denver, CO

Wyoming State Planning Coordinator, Cheyenne, WY

Other Reviewers

Federal Agencies

Department of Agriculture
Forest Service
Soil Conservation Service

Western Area Power Administration

Department of the Interior
Bureau of Indian Affairs
Bureau of Land Management (other offices)

Federal Elected Officials

Office of Senator Alan K. Simpson

Office of Senator Malcolm Wallop

Office of Representative Craig Thomas

State Agencies, Commissions, and University

Office of the Governor of Wyoming

State of Wyoming
Department of Environmental Quality
Department of Agriculture
Game & Fish Department
Geological Survey
Transportation Department
State Engineer
Conservation Commission
Recreation Commission
Board of Land Commissioners
Water Development Commission
University of Wyoming

State Legislators

State senators and state representatives from the Bighorn Basin.

Counties and Cities

Mayors' offices of Basin, Greybull, Meeteetse, Thermopolis, Kirby, and Worland

County Commissioners of Big Horn, Hot Springs, Park, and Washakie counties

Tribal Governments and Native American Leaders

DISTRIBUTION

In addition to the agencies and offices listed above, notices, requests for comments, and copies of this document have been sent to businesses, organizations, interest groups, and individuals. Copies are available for review in the BLM offices in Cheyenne, Worland, and Cody and at the county libraries of Big Horn, Hot Springs, Park, and Washakie counties.

The mailing list for this document is also available for review at the BLM office in Worland.

APPENDIX 1

WILD AND SCENIC RIVERS REVIEW

In developing the Grass Creek RMP EIS, the planning team reviewed all BLM-administered public lands along waterways in the planning area. This review was to determine if any of these public lands met the Wild and Scenic Rivers eligibility criteria and suitability factors, as identified in the Wild and Scenic Rivers Act.

PUBLIC INVOLVEMENT AND COORDINATION

In January 1991, Wyoming BLM staff met with representatives of Wyoming state agencies and the Governor's Office to reach an understanding of the wild and scenic rivers review process and of the wild and scenic rivers eligibility criteria and suitability factors to be used in the process. Agreement was also reached on the need for some refinements in the Wild and Scenic Rivers eligibility criteria and suitability factors, specific to their application to the BLM-administered public lands in Wyoming. The resulting criteria and factors are still consistent with the BLM Wild and Scenic Rivers Manual 8351, released on May 19, 1992.

It is noted that state government disagreed with reviewing waterways that do not contain water year-round (that is, intermittent and ephemeral waterways). The Wyoming BLM recognizes the state's position but is obligated to follow the BLM Manual requirement to include intermittent and ephemeral waterways in the review.

In May 1993, BLM personnel from the Grass Creek Resource Area Office briefed representatives of Wyoming state government on preliminary eligibility findings in the planning area. Similar briefings on the eligibility findings were given to the Wyoming Congressional Delegation representatives and the Bighorn, Hot Springs, Park, and Washakie County Commissioners. Through open houses and direct mailings to interested individuals, the public has been informed of the need for a wild and scenic river review, in descriptions of "planning issues" and "planning criteria." A summary of these public participation activities is available for review in the Grass Creek Resource Area Office.

PROCESS

Definitions

The following definitions apply to key terms used in the review process.

Waterway - A flowing body of water or estuary or a section, portion, or tributary thereof, including rivers, streams, creeks, runs, kills, rills, and small lakes. For purposes of this review, a waterway is not required to have water in it year-round and may be ephemeral or intermittent.

Public lands - The BLM-administered public land surface along waterways within an RMP planning area. Those "split estate lands," where the land surface is state or privately-owned and the federal mineral estate is administered by the BLM, are not involved with these reviews. Other references to segments, parcels, corridors and waterways all represent public lands, which are the basis for our review.

The BLM wild and scenic rivers review, conducted during the development of the RMP, is a three-step process of:

1. Determining if public lands along waterways meet the eligibility criteria to be tentatively classified as wild, scenic or recreational;
2. Determining if any public lands meeting the eligibility criteria also meet the wild and scenic river suitability factors; and
3. Determining how public lands that meet the suitability factors would be managed.

These steps are further defined as follows.

Wild and Scenic Rivers Eligibility Criteria and Tentative Classification

Eligibility Criteria

To meet the eligibility criteria, a waterway must be "free-flowing" and, along with its adjacent land area, must possess one or more "outstandingly remarkable" values. As part of the eligibility review, BLM planning team members reviewed all waterways in the Grass Creek RMP planning area to see if they contained any public lands that met the eligibility criteria. Only those waterways flowing through public lands were considered. The following guidelines were used in applying the eligibility criteria.

1. **Free-flowing.** Free-flowing is defined in the Wild and Scenic Rivers Act as "existing or flowing in natural condition without impoundment, diversion, straightening, rip-rapping, or other modification of the waterway." The existence of small dams, diversion works,

or other minor structures at the time the river segment is being considered shall not automatically disqualify it for possible addition to the National Wild and Scenic Rivers System. A river need not be "boatable or floatable" in order to be eligible; there is no "minimum flow" requirement.

Because of this broad definition all waterways within the planning area were assumed to be free flowing.

2. **Outstandingly Remarkable Values** - The public lands along waterways must also possess one or more outstandingly remarkable values to be eligible for further consideration. Outstandingly remarkable values relate to scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar resource values.

The term "outstandingly remarkable value" is not precisely defined in the Wild and Scenic Rivers Act. However, it should be noted that these values must be directly waterway related. The criteria for outstandingly remarkable values, used for the review of public lands in the Grass Creek RMP planning area, were:

1. **Scenic** - The landscape elements of landform, vegetation, water, color and related factors result in notable or exemplary visual features and/or attractions. Additional factors such as seasonal variations in vegetation, scale of cultural modifications, and length of time negative intrusions are viewed can also be considered when analyzing scenic values. Scenery and visual attractions may be highly diverse over the majority of the public lands involved; are not common to other waterways in the area; and must be of a quality to attract visitors from outside the area.

2. **Recreational** - Recreational opportunities on the public lands are unique enough to attract visitors from outside the area. Visitors would be willing to travel long distances to use the waterway resources on the public lands for recreational purposes. Waterway-related opportunities could include, but are not limited to, sightseeing, wildlife observation, photography, hiking, fishing, hunting, and boating.

   Interpretive opportunities may be exceptional and attract visitors from outside the area. The waterway may provide settings for national or regional commercial usage or competitive events.

3. **Geologic** - The public lands provide an example of a geologic feature, process, or phenomenon that is rare, unusual, one-of-a-kind or unique to the area. The feature may be in an unusually active stage of development, represent a "textbook" example and/or represent a unique or rare combination of geologic features (for example, erosional, volcanic, glacial and other geologic structures).

4. **Fisheries** - The fishery values on the public lands may be judged on the relative merits of either fish populations or habitat, or a combination of these conditions. For example:

   a. **Populations.** The waterway on public lands is a contributor to one of the top producers of resident fish species, either nationally or in the area. Of particular significance is the presence of wild stocks and(or) federally-listed or candidate threatened or endangered species. Diversity of species is also important.

   b. **Habitat.** The public lands are contributing to exceptionally high quality fish habitat for resident species and federally-listed or candidate threatened and endangered species.

5. **Wildlife** - Wildlife values on the public lands may be judged on the relative merits of either wildlife populations or habitat, or a combination of these conditions. For example:

   a. **Populations.** The public lands contribute to populations of resident wildlife species important in the area or nationally. Of particular significance are species considered to be unique or populations of federally listed or candidate threatened or endangered species. Diversity of species is also important.

   b. **Habitat.** The public lands are contributing to exceptionally high quality habitat for wildlife species important in the area or nationally, or may provide unique habitat or a critical link in habitat conditions for federally listed or candidate threatened or endangered species. Adjacent habitat conditions are such that the biological needs of the species are met.

6. **Cultural** - The public lands contain examples of outstanding cultural sites which have unusual characteristics relating to prehistoric or historic use. Sites may be important in the area or nationally for interpreting prehistory or history; may be rare and represent an area where a culture or cultural period was first identified and described; may have been used concurrently by two or more cultural groups; or may have been used by cultural groups for rare or sacred purposes.

7. **Historical** - The public lands contain a site or feature associated with a significant event, an important person, or a cultural activity of the past that was rare, unusual, or one-of-a-kind in the area (although eligibility for inclusion in the National Register of Historic Places, by itself, is not sufficient justification for being considered outstandingly remarkable).

8. **Similar Values** - Other values may include significant hydrologic, paleontologic, botanic, scientific, or ecologic resources as long as they are waterway-related.

Tentative Classification

At the same time that eligibility determinations are made, eligible waterways are also given a tentative classification (that is, either wild, scenic or recreational), as required by the Act. Tentative classification is based on the type and degree of human developments associated with the waterway and adjacent public lands at the time of the review. Actual classification is a congressional legislative determination.

The tentative classifications, as used by BLM in Wyoming, are further defined as:

Wild Waterway Areas - Wild areas are those where the waterways are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America. Wild means undeveloped; roads, dams, or diversion works are generally absent from a quarter mile corridor on both sides of the waterway.

Scenic Waterway Areas - Scenic areas are those where the waterways are generally free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads. Scenic does not necessarily mean the waterway corridor has to have scenery as an outstandingly remarkable value; however, it means the waterway may contain more development (except for major dams or diversion works) than a wild segment and less development than a recreational segment. For example, roads may cross the waterway in places but generally do not run parallel to it. In certain cases, however, if a parallel road is unpaved and well screened from the waterway by vegetation, it could qualify for scenic classification.

Recreational Waterway Areas - Recreational areas are those where the waterways on the public lands are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past. Parallel roads or railroads, existence of small dams or diversions can be allowed in this classification. A recreational area classification does not imply that the waterway or section of waterway on the public lands will be managed or have priority for recreational use or development.

Wild and Scenic Rivers Suitability Factors

All of the public lands that are found to meet the eligibility criteria and that are classified (for example, wild, scenic, or recreational) would be further reviewed to determine if they meet the wild and scenic rivers suitability factors. The suitability determinations would be made after the general public, local, state and federal governments and agencies, and other interested parties have reviewed the eligibility and classification determinations.

Some factors to be considered in making the suitability determinations include, but are not limited to:

1. Characteristics which would make the public lands a worthy addition to the national Wild and Scenic Rivers System.
2. Current status of landownership and land and resource uses in the area, including the amount of private land, and any associated or conflicting private land uses.
3. Reasonably foreseeable potential uses of the public lands and related waters which would be enhanced, foreclosed, or curtailed if they were included in the national system, and the values which could be foreclosed or diminished if the public lands are not protected as part of the system.
4. Public, state, local, or federal interest in designation of the waterway, including the extent to which the administration of the waterway, including the costs thereof, may be shared by state, local, or other agencies and individuals.
5. Estimated cost of acquiring necessary lands and administering the area if it is added to the national system.
6. Ability of the BLM to manage the public lands as a Wild and Scenic River.
7. Historical or existing rights which would be adversely affected as to foreclose, extinguish, curtail, infringe, or constitute a taking which would entitle the owner to just compensation if the public lands were included in the national system. In the suitability review, adequate consideration would be given to rights held by other landowners and applicants, lessees, claimants or authorized users of the public lands.
8. Other issues and concerns identified in the land-use planning process.

Management of Public Lands That Meet the Suitability Factors

BLM land use planning decisions would be developed and implemented for any public lands that are determined to meet the suitability factors. These planning decisions would include management objectives, management actions, and appropriate allocations of land and resource uses that would maintain the outstandingly remarkable values and tentative wild and scenic waterway classifications. The Grass Creek RMP would be amended as necessary.

Public lands that are determined to meet the suitability factors would then be managed under the BLM's land use plan management decisions, indefinitely. At some time in the future, it is possible that the Secretary of the Interior may direct the BLM to participate in the development of Wild and Scenic Rivers Study Reports. The results and documentation of the BLM wild and scenic river reviews for the Grass Creek RMP planning area would be used in developing any such reports.

RESULTS OF THE WILD AND SCENIC RIVERS ELIGIBILITY REVIEW

The Grass Creek planning team met on April 14, 1993, to conduct the eligibility review for the waterways in the Grass Creek RMP planning area.

Because of the broad interpretation of the "free flowing" criterion, all waterways reviewed were assumed to be free-flowing. Using an interdisciplinary approach, these waterways were reviewed to determine whether any public lands along their courses contained any of the outstandingly remarkable values described in the eligibility criteria. Of the 123 waterways reviewed in the RMP planning area, none were found to have public lands with outstandingly remarkable values. Therefore, it was determined that none of the public lands along waterways in the Grass Creek RMP planning area meet the eligibility criteria.

Pending any new information that may be provided, during public involvement activities for the RMP, that would change this determination, no public lands along waterways in the planning area will be reviewed under the wild and scenic rivers suitability factors and none will be given further consideration for possible inclusion in the National Wild and Scenic Rivers System. All such public lands and their inherent resource values will be managed in accordance with the provisions of the Grass Creek Resource Management Plan, when it is completed.

Table 1-1 lists the waterways that were reviewed and summarizes the results of the wild and scenic rivers eligibility review on the public lands in the planning area. The public lands along 123 waterways in the Grass Creek RMP Planning Area were reviewed.

TABLE 1-1
GRASS CREEK RESOURCE AREA
WILD AND SCENIC RIVERS ELIGIBILITY REVIEW

River/Stream (Waterway) Reviewed	Free Flowing	Outstandingly Remarkable Values on Public Lands	BLM-administered Lands Eligible?
Additional Creek	Yes	No	No
Alamo Creek	Yes	No	No
Antelope Creek	Yes	No	No
Badger Creek	Yes	No	No
Badger Gulch	Yes	No	No
Big Draw	Yes	No	No
Bighorn River	Yes	No	No
Black Draw	Yes	No	No
Blackburn Gulch	Yes	No	No
Blue Creek	Yes	No	No
Bobcat Draw	Yes	No	No

TABLE 1-1 (continued)
GRASS CREEK RESOURCE AREA
WILD AND SCENIC RIVERS ELIGIBILITY REVIEW

River/Stream (Waterway) Reviewed	Free Flowing	Outstandingly Remarkable Values on Public Lands	BLM-administered Lands Eligible?
Buck Creek	Yes	No	No
Buffalo Creek	Yes	No	No
Coal Draw	Yes	No	No
Coal Mine Draw	Yes	No	No
Cottonwood Creek	Yes	No	No
Cottonwood Creek Tributaries	Yes	No	No
Crooked Creek	Yes	No	No
Curry Creek	Yes	No	No
Deer Creek	Yes	No	No
Deer Creek Tributary	Yes	No	No
Dorsey Creek	Yes	No	No
Dorsey Creek Tributary	Yes	No	No
Dry Cottonwood Creek	Yes	No	No
Dug Out Draw	Yes	No	No
East Fork Twentyone Creek Tributary	Yes	No	No
Egbert Draw	Yes	No	No
Egbert Draw Tributary	Yes	No	No
Elk Creek (near Basin)	Yes	No	No
Elk Creek (near Wall Rock)	Yes	No	No
Elk Creek (near Wall Rock) Tributary	Yes	No	No
Enos Creek	Yes	No	No
Enos Creek Tributary	Yes	No	No
Fall Creek	Yes	No	No
Fenton Draw	Yes	No	No
Fifteenmile Creek	Yes	No	No
Fifteenmile Creek Tributary	Yes	No	No
Fivemile Creek	Yes	No	No
Gooseberry Creek	Yes	No	No
Gooseberry Creek Tributary	Yes	No	No
Grass Creek	Yes	No	No
Grass Creek Tributary	Yes	No	No
Greybull River	Yes	No	No
Greybull River Tributary	Yes	No	No
Hess Creek Draw	Yes	No	No
Hess Creek Draw Tributary	Yes	No	No
Hulse Creek	Yes	No	No
Iron Creek	Yes	No	No
Kester Coulee	Yes	No	No
Klicker Creek	Yes	No	No
Lake Creek Tributary	Yes	No	No
Left Hand Creek	Yes	No	No
Little Sand Draw	Yes	No	No
Little Prospect Creek	Yes	No	No
Little Gooseberry Creek	Yes	No	No
Lower Sand Draw	Yes	No	No

APPENDIX 1

TABLE 1-1 (continued)
GRASS CREEK RESOURCE AREA
WILD AND SCENIC RIVERS ELIGIBILITY REVIEW

River/Stream (Waterway) Reviewed	Free Flowing	Outstandingly Remarkable Values on Public Lands	BLM-administered Lands Eligible?
Mackey Gulch	Yes	No	No
McGee Gulch	Yes	No	No
Meadow Creek	Yes	No	No
Middle Creek	Yes	No	No
Middle Creek Tributary	Yes	No	No
Middle Fork Fifteenmile Creek	Yes	No	No
Middle Fork Owl Creek	Yes	No	No
Milk Creek	Yes	No	No
Mormon Creek	Yes	No	No
North Fork Owl Creek	Yes	No	No
North Fork Owl Creek Tributary	Yes	No	No
North Fork Fifteenmile Creek	Yes	No	No
Otto Creek	Yes	No	No
Otto Creek Tributary	Yes	No	No
Owl Creek	Yes	No	No
Owl Creek Tributary	Yes	No	No
Prospect Creek	Yes	No	No
Quartz Gulch	Yes	No	No
Raspberry Draw	Yes	No	No
Raspberry Draw Tributary	Yes	No	No
Rattlesnake Gulch	Yes	No	No
Rattlesnake Creek	Yes	No	No
Rattlesnake Creek Tributary	Yes	No	No
Red Canyon Creek	Yes	No	No
Renner Draw	Yes	No	No
Renner Draw Tributary	Yes	No	No
Reservoir Creek	Yes	No	No
Roach Creek	Yes	No	No
Roach Creek Tributary	Yes	No	No
Rock Waterhole Creek	Yes	No	No
Rock Creek	Yes	No	No
Rock Creek Tributary	Yes	No	No
Rooster Creek	Yes	No	No
Sand Draw (near Blue Ridge)	Yes	No	No
Sand Draw (near Blue Ridge) Tributary	Yes	No	No
Sand Draw (near Kirby)	Yes	No	No
Sand Draw (near Kirby) Tributary	Yes	No	No
Sanford Draw	Yes	No	No
Slab Creek	Yes	No	No
South Fork Owl Creek	Yes	No	No
South Fork Owl Creek Tributary	Yes	No	No
South Branch Middle Fork Owl Creek	Yes	No	No
South Branch Middle Fork Owl Creek Tributary	Yes	No	No
South Fork of North Fork Owl Creek	Yes	No	No
South Fork of North Fork Owl Creek Tributary	Yes	No	No

TABLE 1-1 (continued)
GRASS CREEK RESOURCE AREA
WILD AND SCENIC RIVERS ELIGIBILITY REVIEW

River/Stream (Waterway) Reviewed	Free Flowing	Outstandingly Remarkable Values on Public Lands	BLM-administered Lands Eligible?
South Fork Coal Draw	Yes	No	No
South Fork Fifteenmile Creek	Yes	No	No
South Fork Cottonwood Creek	Yes	No	No
South Fork Cottonwood Creek Tributary	Yes	No	No
South Fork Left Hand Creek	Yes	No	No
South Fork Elk Creek	Yes	No	No
Spring Gulch	Yes	No	No
Tenmile Creek	Yes	No	No
Thompson Draw	Yes	No	No
Timber Creek	Yes	No	No
Twentyone Creek	Yes	No	No
Twentyone Creek Tributary	Yes	No	No
Vass Creek	Yes	No	No
Wagonhound Creek	Yes	No	No
Wagonhound Creek Tributary	Yes	No	No
West Fork Twentyone Creek	Yes	No	No
Willow Creek (in Owl Creek)	Yes	No	No
Willow Creek (near Otto)	Yes	No	No
Wood River	Yes	No	No

APPENDIX 2

LANDS AND REALTY

WITHDRAWALS AND CLASSIFICATIONS

Table 2-1 provides information on withdrawals and classifications in the planning area.

TABLE 2-1
WITHDRAWALS AND CLASSIFICATIONS[1]

Type	Public Land Acres Withdrawn or Classified	Segregative Effect and Original Purpose of the Withdrawal or Classification
Administrative Site Withdrawal (Forest Service Cabin)	40	Prohibits mineral entry (the staking and development of mining claims). Prohibits agricultural entry and disposal of the land through sale or exchange.
Desert Land Entry Classification	457	Prohibits mineral entry and disposal of the land through mineral patent. The original purpose was to reserve arid public lands for conversion to croplands through irrigation.
Power Site Classification	2,650	Prohibits agricultural entry and disposal through sale or exchange. Places limits on mineral entry. The purpose was to reserve suitable public lands for the construction of dams for generating electrical power.
Public Water Reserve	735	Prohibits mineral entry for nonmetalliferous minerals. Prohibits agricultural entry and sale or exchange of the the land. The purpose was to prevent the monopoly of important water sources on public land needed for livestock grazing.
R&PP Classification	470	Prohibits mineral and agricultural entry and disposal of the land through mineral patent, sale, or exchange. The purpose was to reserve public lands for recreation and public purposes, to meet the needs of state and local government and other qualified organizations.
Reclamation Withdrawal	4,700	Prohibits mineral and agricultural entry and disposal of the land through mineral patent, sale, or exchange. The purpose was to reserve arid public lands for conversion to croplands through irrigation.
Coal Classification	129,160	Prohibits coal development and mineral entry for nonmetalliferous minerals. The purpose was to reserve public lands that were potentially valuable for coal to provide for their orderly development.

TABLE 2-1 (continued)
WITHDRAWALS AND CLASSIFICATIONS[1]

Type	Public Land Acres Withdrawn or Classified	Segregative Effect and Original Purpose of the Withdrawal or Classification
Phosphate Classification	7,730	Prohibits phosphate development and mineral entry for nonmetalliferous minerals. The purpose was to reserve public lands that were potentially valuable for phosphate to provide for their orderly development.

[1]All of the cited withdrawals and classifications, with the exception of reclamation withdrawals, are administered by the BLM

POSSIBLE LANDOWNERSHIP ADJUSTMENTS

Possible landownership adjustments by sale, exchange, transfer, or acquisition would be considered case-by-case. These would include transfers of BLM-administered public lands to private, county, or state ownership. Adjustments may be accomplished by exchange, public sale, Recreation and Public Purposes Act patent, or mineral patent. The acquisition of lands by BLM usually would be accomplished through exchange.

Review Process

No landownership adjustments would be implemented without a feasibility study, site-specific environmental analyses, and a determination that the sale, exchange, or transfer is in the public interest. Public lands in certain categories would not be considered for landownership adjustment.

Criteria for Sale, Exchange, or Transfer of Lands

Lands Not to be Sold, Exchanged, or Transferred

— Lands withdrawn from operation of the public land laws or segregated pending withdrawal.

— Lands in wilderness study areas.

— Lands with mining claims of record under section 314 of FLPMA, unless BLM policy is changed in the future to allow for their transfer.

— Lands with known or suspected hazardous waste contamination.

— Lands containing federally listed endangered, threatened, candidate, or emphasis species or important riparian/wetland areas, unless a primary purpose of the ownership adjustment is to improve management of these values.

Other Factors to be Considered

The following conditions would be evaluated during the review process. The degree to which any of these conditions apply to a proposed ownership adjustment may or may not make the lands suitable for sale, exchange, transfer, or acquisition.

— Mineral values.

— Location of the lands in relation to ACECs, protective withdrawals, or other areas of special management concern, including VRM class I or II areas and lands with opportunities for semiprimitive nonmotorized recreation.

— Potential effects on the local economy, including effects on the tax base.

— Whether the lands contain cultural resources eligible for listing on the National Register of Historic Places, or important paleontological resources.

— The importance of the lands for wildlife resources, as in the following examples. Used by state-listed rare or uncommon species or species in need of special management or by state-protected mammals.

— Used by wildlife species of high federal or state interest.

— Tracts identified as potential recovery habitat for federally listed endangered, threatened, candidate, or emphasis species.

APPENDIX 3

LIVESTOCK GRAZING MANAGEMENT

INTRODUCTION

The authority for managing livestock grazing on public lands is provided by the Taylor Grazing Act of 1934, the Federal Land Policy and Management Act of 1976, and the Public Rangelands Improvement Act of 1978. The grazing allotment is the fundamental management unit of the rangeland program. Table 3-1 lists the grazing allotments in the planning area by landownership status.

TABLE 3-1
GRAZING ALLOTMENTS ACREAGE BY LANDOWNERSHIP STATUS

Allotment Number	Allotment Name	Public Land Administered by the BLM	Private Land, State of Wyoming Land, and Land Administered by Other Federal Agencies	Total Acres
00063	Railroad Swamp	100	30	130
00503	Cottonwood Common	5,694	712	6,406
00504	Hamilton Dome	11,125	1,156	12,281
00506	Common Harvey	965	242	1,207
00507	South Gooseberry Group	58,468	5,628	64,096
00508	North Gooseberry	113,805	11,639	125,444
00509	New Burlington Group	93,556	3,355	96,911
00510	Fernandez Blu-Jay	8,912	2,015	10,927
00511	East Tanner	252	357	609
00512	Coulter Group	11,516	909	12,425
00513	Dockery Hammond	741	16	757
00515	Upper Gooseberry	3,301	13,590	16,891
00516	Blue Creek	1,888	3,683	5,571
00519	Middle Creek	545	1,255	1,800
00520	Red Creek	124	663	787
00521	Lower Cottonwood	6,566	796	7,362
00522	Grass Creek	8,994	1,943	10,937
00523	Highway Junction	5,590	275	5,865
00524	Cottonwood	1,202	1,371	2,573
00525	Rock Creek	4,31	16,338	10,649
00526	Sand Springs	3,331	1,058	4,389
00527	Blackstone	797	26	823
00528	Six Mile	1,766	243	2,009
00529	Prospect Common	7,832	3,715	11,547
00530	Grass Creek Basin	1,819	1,898	3,717
00531	Spring Gulch	1,982	0	1,982
00532	Whiskey Gulch	356	546	902
00533	Home Ranch	938	71	1,009
00534	East Cottonwood	3,413	3,540	6,953
00535	West Cottonwood	7,113	7,463	14,576
00536	Heifer	882	903	1,785
00537	Padlock	2,257	2,538	4,795
00538	East Waugh Dome	2,600	2	2,602

TABLE 3-1 (continued)
GRAZING ALLOTMENTS ACREAGE BY LANDOWNERSHIP STATUS

Allotment Number	Allotment Name	Public Land Administered by the BLM	Private Land, State of Wyoming Land, and Land Administered by Other Federal Agencies	Total Acres
00539	Individual	339	1,519	1,858
00540	Bridges	757	797	1,554
00541	Three Peaks	985	620	1,605
00543	Cannady Individual	928	346	1,274
00544	Maller Individual	127	4	131
00545	Grass Point	4,138	1,773	5,911
00546	Highway	1,149	86	1,235
00548	D & LM Individual	1,903	111	2,014
00549	Greybull Bend	380	89	469
00551	Coulee-Mill Iron	2,461	211	2,672
00552	Milk Creek	382	627	1,009
00553	Richmond	3,934	2,561	6,495
00554	Waugh Dome	2,255	316	2,571
00556	21 Creek	1,808	551	2,359
00557	Ramul Individual	135	198	333
00558	Buck Creek	488	741	1,229
00559	East Five Mile	1,888	2,972	4,860
00560	SFNF	1,086	656	1,742
00561	Freudenthal Ind.	1,935	3,313	5,248
00564	Little Buffalo Basin	2,277	0	2,277
00566	Meeteetse Draw	2,026	358	2,384
00567	Lucerne	2,460	80	2,540
00568	Basin	8,527	8,783	17,310
00569	Curtis	3,388	12,190	15,579
00572	Eagle Draw	1,882	938	2,820
00573	Wagonhound Bench	3,478	2,444	5,922
00574	Coal Draw	6,551	1,178	7,729
00575	Slab Creek	1,016	2,658	3,674
00576	South Fork Elk Creek	8,335	635	8,970
00577	South Basin	12,614	1,085	13,699
00578	North Basin Group	5,392	385	5,777
00579	Buffalo Creek	9,187	6,208	15,395
00580	Coal Mine	469	618	1,087
00582	Mill Iron East	404	972	1,376
00583	Mud Creek	182	153	335
00584	Jones Flat	121	1,459	1,580
00585	North Hart	561	1,016	1,577
00586	South Hart	85	624	709
00587	Tyber Pasture	254	968	1,222
00588	Sandstone	536	25	561
00590	Sand Draw	2,756	0	2,756
00593	Hamilton Rim	570	1,520	2,090
00594	Buffalo Basin	1,369	2,042	3,411
00595	Iron Creek	1,312	520	1,832

TABLE 3-1 (continued)
GRAZING ALLOTMENTS ACREAGE BY LANDOWNERSHIP STATUS

Allotment Number	Allotment Name	Public Land Administered by the BLM	Private Land, State of Wyoming Land, and Land Administered by Other Federal Agencies	Total Acres
00596	Wagonhound	8,198	4,000	12,198
00599	Gooseberry	3,108	11,713	14,821
00600	Wall Rock	1,084	2,032	3,116
00601	Mormon Creek	307	2,243	2,550
00604	Dickie	101,548	47,019	148,567
00607	Lake Creek	3,621	2,803	6,424
00608	Vass	693	651	1,344
00609	Owl Creek	1,867	2,257	4,124
00610	South Owl Creek	888	159	1,047
00611	Neves Individual	67	10	77
00612	South Tatman	2,241	946	3,187
00613	Putney Flat	817	1,279	2,096
00614	Rattlesnake	789	847	1,636
00615	Lime Ridge	959	1,598	2,557
00616	Home	3,851	625	4,476
00617	Gloyd Individual	119	3	122
00618	North Blackstone	699	108	807
00619	Elk Creek	19,513	1,081	20,594
00620	Prospect	4,956	2,859	7,815
00621	North Grass Creek	2,348	648	2,996
00622	South Highway	8,977	13	8,990
00623	North Highway	6,655	1,317	7,972
00626	Timber Creek	8,098	646	8,744
00627	Rooster Creek	3,017	6,653	9,570
00628	Hole in the Ground	1,984	2,651	4,635
00629	Rankine	18	761	779
00633	Upper Pastures	4,463	4,706	9,169
00634	Lower Pastures	9,998	2,919	12,917
00636	Haynes	455	101	556
00637	Adam Wiess Peak	3,681	2,612	6,293
00638	King Dome	4,741	873	5,614
00639	Tatman Mt. Common	17,986	4,119	22,105
00640	Snyder	11,118	2,240	13,358
00641	Swing Individual	472	582	1,054
00643	Buchanan	3,358	397	3,755
00644	Tanner	4,266	2,610	6,876
00645	South Coal Draw	4,738	1,969	6,707
00646	Back of Rim	5,223	1,612	6,835
00647	Steer	2,089	717	2,806
00648	Shumway Individual	357	294	651
00650	South Gebo Common	1,857	38	1,895
00651	West Five Mile	39,870	46	39,916
00652	Badger Gulch	18,864	6,748	25,612
00653	Red Lane	636	457	1,093

TABLE 3-1 (continued)
GRAZING ALLOTMENTS ACREAGE BY LANDOWNERSHIP STATUS

Allotment Number	Allotment Name	Public Land Administered by the BLM	Private Land, State of Wyoming Land, and Land Administered by Other Federal Agencies	Total Acres
00654	Ayers Individual	609	1,544	2,153
00657	West	969	42	1,011
00661	Three Peaks Anchor	6,714	12,107	18,821
00662	Enright	9,608	2,907	12,515
00663	Cow Pasture	1,949	3,569	5,518
00664	Alamo Creek	328	267	595
00665	Nelson	14,266	1,957	16,223
00668	Dorsey Creek	10,076	33	10,109
00669	Allen Basin	12,900	2,332	15,232
00670	Upper 15-Mile	441	3,327	3,768
00671	10-Mile	24,199	1,069	25,268
00672	Mountain	1,002	1,526	2,528
00674	North Tatman	9,463	1,799	11,262
00676	Pitchfork	14,235	679	14,914
00678	South Grass Creek	9,068	3,817	12,885
00679	North Rim	921	533	1,454
00680	Lake Creek Pasture	758	5,341	6,099
00681	Spring Creek	1,611	2,474	4,085
00682	Hunt Oil 15-Mile	16,107	1,227	17,334
00683	South Sleeper	4,666	707	5,373
00684	South Greybull	410	101	511
00720	Putney Place	454	1,138	1,592
00721	Urwin Homestead	167	531	698
00722	Wales Homestead	108	608	716
01065	YU Bench	36	2	38
01077	Lower	64	79	143
02501	Arapahoe Ranch	465	298	763
02505	Lower Red Canyon	2,261	206	2,467
02510	Gould Individual	2,310	1,870	4,180
02511	Gould Individual	93	3	96
02522	Kruger Sec. 15	80	4	84
02534	Renner Sec. 15	0	135	135
02539	Red Canyon	6,480	4,926	11,406
02555	Lawler Sec. 15	1,194	4,196	5,390
02562	Meeteetse-East	984	1,717	2,701
02563	Larson Sec. 15	515	19	534
03033	Hogg	1,132	1,221	2,353
PLANNING AREA TOTALS		**962,808**	**334,506**	**1,287,314**

COMPONENTS OF THE LIVESTOCK GRAZING MANAGEMENT PROGRAM

1. Administration - Processing and transferring grazing permits, compiling and issuing grazing bills, record keeping, data reporting, and responding to public inquiries are the key elements of the program administration.
2. Grazing Management - Through consultation with livestock permittees, and other affected interests, range management objectives and strategies are established and range projects are developed to maintain or improve rangeland resources.
3. Monitoring - Rangeland trend, use of forage, duration and season of grazing, and precipitation data are recorded. This data is used to evaluate the effects of grazing on rangeland ecosystems and to establish the carrying capacity of grazing allotments.
4. Supervision - Public lands are periodically inspected to assure compliance with authorized grazing permits.

ALLOTMENT CATEGORIZATION

A selective management process was developed to assign priorities for range management in the planning area. Each grazing allotment was placed in one of three categories: "I" Improve, "M" Maintain, or "C" Custodial. Resource conditions and conflicts, the potential for resources to improve, the economic return, and the current management approach are considered. The following criteria are used to assign allotments to the management categories. Allotment categories can change based on new resource information.

Category "M" Maintain

The objective is to maintain or improve the existing resource conditions and productivity.

The criteria are:

— The present range conditions are satisfactory and existing management is expected to maintain or improve conditions.

— The allotment is producing at or near its potential.

— Conflicts with livestock grazing are minor.

— Intensive monitoring is not warranted or management has been changed and intensive monitoring is needed to verify that satisfactory conditions will be maintained.

— Opportunities for positive economic return from public or private investment may exist.

Category "I" Improve

The objective is to improve resource conditions and productivity to enhance overall multiple use opportunities.

The criteria are:

— Current range condition is unsatisfactory. Trend is static or downward.

— Current grazing management practices need modification to meet resource objectives.

— Allotment is not producing at or near its potential.

— Resource values on public land may be adversely affected by the current livestock use.

— Intensive monitoring is required to address resource issues, conflicts, or declining trend; or to verify that an improved trend is continuing based on new management actions.

— Opportunities for positive economic return from public or private investment may exist.

— Intensive management for other resources such as wildlife and watershed is necessary even though allotment condition associated with livestock grazing is satisfactory.

Category "C" Custodial Management

The objective is to manage lands in a custodial manner that will prevent deterioration of current resource conditions.

The criteria are:

— The current range condition and potential varies, but the trend is static or upward.

— Opportunities for positive economic return on public investments are minor.

— Conflicts between livestock grazing and other resources on public land are minor.

— Intensive monitoring is not warranted because of the lack of issues.

AUTHORIZED GRAZING USE

Table 3-2 lists selective management category, authorized grazing preference, and the privately controlled AUMs associated with each allotment.

Table 3-3 lists actual grazing use for each allotment that has occurred in the planning area during two five-year periods. The "Season of Use" is authorized on the permit. No season is used when the allotment has very small amounts of public land. The "Kind of Livestock" are: Cattle (C), Horses (H), and Sheep (S). It is common for permittees to actually use fewer AUMs than the total authorized.

VEGETATION INVENTORY

An Ecological Site Inventory of the Grass Creek Resource Area was conducted from June 1977 to October 1979. Since 1983, approximately 35,000 acres have been evaluated and updated through range monitoring. Table 3-4 shows the ecological condition of rangelands by allotment in the planning area. Ecological condition classes were determined by comparing the present plant community with that of the potential natural community as indicated by the Soil Conservation Service (SCS) range condition guide for the site. Four classes are used to express the degree that a present plant community reflects its potential natural community: for example, if the seral stage or ecological status represents 76 percent to 100 percent of the potential natural community, it is rated excellent; 51 percent to 75 percent (late seral), good; 26 percent to 50 percent (mid seral), fair; or 0 percent to 25 percent (early seral), poor. Woodlands, forests, barren, and alpine areas are unclassified.

Based on an analysis of information from the three previous tables, Table 3-5 compares stocking levels, actual use, and suitability. The columns headings are described below and labeled A through F.

A - Total Authorized Grazing Use AUMs: The sum of active preference and private and state AUMs, from Table 3-2. These are the maximum number of AUMs that can be grazed as authorized on grazing permits.

B - Average Actual Use: The total (public, private, and state) grazing use measured in AUMs that is estimated to have taken place.

C - Recommended Stocking Level: Using the rangeland vegetation inventory data, this column shows the recommended stocking levels based on SCS technical site guides.

D - Suitable AUMs: The portion of the recommended stocking rate available to cattle during the summer, based on water availability, slope, and vegetative production. Suitability indicates that compared to the total forage produced on these allotments, about 82 percent is available for cattle. Available forage was not adjusted for suitability in sheep allotments or where the cattle graze in the winter, early spring, and late fall. Horses were treated the same as cattle when adjusting for suitability.

E - Available AUMs Versus Suitable AUMs (Percentage): This compares the AUMs of forage that are authorized for use with the AUMs that are suitable for use. If the total authorized AUMs are more than the suitable AUMs, the percentage will be greater than 100. This means that if all the authorized AUMs were used, parts of an allotment could be overgrazed.

F - Average Actual Use AUMs Versus Suitable AUMs (Percentage): This compares the AUMs of forage that were actually used with the AUMs that are suitable for use. If the actual use AUMs are more than the suitable AUMs, the percentage will be greater than 100. This means that the actual use taking place is probably causing parts of an allotment to be overgrazed.

TABLE 3-2
AUTHORIZED GRAZING USE INFORMATION BY ALLOTMENT

Allotment Number	Allotment Name	Selective Management Category	Grazing Preference (AUMs)[1]	Suspended Preference (AUMs)[1]	Active Preference (AUMs)[1]	State and Private (AUM s)	Total Available AUMs	Public Land Use (Percentage)[1]
00063	Railroad Swamp	M	11	0	11	0	11	100
00503	Cottonwood Common	I	438	26	412	56	468	88
00504	Hamilton Dome	I	1,000	201	799	92	891	90
00506	Common Harvey	I	358	260	98	0	98	100
00507	South Gooseberry Group	I	6,523	1,997	4,526	369	4,895	92
00508	North Gooseberry	I	11,696	3,177	8,519	876	9,395	91
00509	New Burlington Group	I	11,035	3,771	7,264	385	7,649	95
00510	Fernandez Blu-Jay	I	1,913	1,078	835	212	1,047	80
00511	East Tanner	M	33	0	33	30	63	52
00512	Coulter Group	I	1,110	444	666	36	702	95
00513	Dockery Hammond	C	80	0	80	0	80	100
00515	Upper Gooseberry	M	868	0	868	4,557	5,425	16
00516	Blue Creek	I	320	236	84	221	305	28
00519	Middle Creek	I	126	0	126	324	450	28
00520	Red Creek	C	21	0	21	0	21	NLTN[2]
00521	Lower Cottonwood	I	432	21	411	61	472	87
00522	Grass Creek	I	1,284	335	949	283	1,232	77
00523	Highway Junction	I	955	292	663	82	745	89
00524	Cottonwood	I	285	0	285	378	663	43
00525	Rock Creek	I	685	485	200	800	1,000	20
00526	Sand Springs	I	1,305	519	786	149	935	84
00527	Blackstone	C	450	279	171	0	171	100
00528	Six Mile	I	400	266	134	0	134	100
00529	Prospect Common	I	1,332	125	1,207	650	1,857	65
00530	Grass Creek Basin	C	337	0	337	527	864	39
00531	Spring Gulch	I	295	0	295	0	295	100
00532	Whiskey Gulch	I	79	0	79	160	239	33
00533	Home Ranch	I	143	11	132	44	176	75
00534	East Cottonwood	C	340	0	340	368	708	48
00535	West Cottonwood	C	810	0	810	878	1,688	48
00536	Heider	M	225	0	225	244	469	48
00537	Padlock	I	525	15	510	734	1,244	41
00538	East Waugh Dome	C	900	692	208	0	208	100
00539	Individual	I	250	125	125	3	128	98
00540	Bridges	C	215	25	190	489	679	28
00541	Three Peaks	I	250	190	60	240	300	20

TABLE 3-2 (continued)
AUTHORIZED GRAZING USE INFORMATION BY ALLOTMENT

Allotment Number	Allotment Name	Selective Management Category	Grazing Preference (AUMs)[1]	Suspended Preference (AUMs)[1]	Active Preference (AUMs)[1]	State and Private (AUM s)	Total Available AUMs	Public Land Use (Percentage)[1]
00543	Cannady Individual	I	60	2	58	1	59	98
00544	Maller Individual	C	21	8	13	0	13	100
00545	Grass Point	I	730	183	547	257	804	680
00546	Highway	I	193	86	107	0	107	100
00548	D&LM Individual	I	200	49	151	23	174	87
00549	Greybull Bend	C	42	5	37	2	39	95
00551	Coulee-Mill Iron	M	493	0	493	43	536	92
00552	Milk Creek	M	181	73	108	184	292	37
00553	Richmond	I	1,000	401	599	367	966	62
00554	Waugh Dome	C	200	62	138	17	155	89
00556	21 Creek	I	536	216	320	85	405	79
00557	Ramul Individual	M	50	32	18	0	18	NLTN[2]
00558	Buck Creek	I	95	0	95	211	306	31
00559	East Five Mile	C	540	140	400	11	411	97
00560	SFNF	I	230	0	230	69	299	77
00561	Freudenthal Individual	C	316	48	268	341	609	44
00564	Little Buffalo Basin	M	625	63	562	0	562	100
00566	Meeteetse Draw	I	375	157	218	27	245	89
00567	Lucerne	C	342	154	188	8	196	96
00568	Basin	I	1,072	0	1,072	1,825	2,897	37
00569	Curtis	I	560	0	560	2,403	2,963	19
00572	Eagle Draw	M	440	0	440	227	667	66
00573	Wagonhound Bench	I	570	8	562	391	953	59
00574	Coal Draw	M	930	6	924	231	1,155	80
00575	Slab Creek	I	227	0	227	614	841	27
00576	South Fork Elk Creek	I	815	0	815	0	815	100
00577	South Basin	I	1,090	220	870	46	916	95
00578	North Basin Group	I	235	35	200	0	200	100
00579	Buffalo Creek	I	1,771	319	1,452	968	2,420	60
00580	Coal Creek	I	125	28	97	140	237	41
00582	Mill Iron East	M	66	0	66	248	314	21
00583	Mud Creek	C	33	12	21	0	21	NLTN[2]
00584	Jones Flat	C	32	0	32	1,568	1,600	NLTN[2]
00585	North Hart	I	78	0	78	127	205	38
00586	South Hart	C	9	0	9	120	129	NLTN[2]
00587	Tyber Pasture	C	30	0	30	146	176	NLTN[2]

TABLE 3-2 (continued)
AUTHORIZED GRAZING USE INFORMATION BY ALLOTMENT

Allotment Number	Allotment Name	Selective Management Category	Grazing Preference (AUMs)[1]	Suspended Preference (AUMs)[1]	Active Preference (AUMs)[1]	State and Private (AUM s)	Total Available AUMs	Public Land Use (Percentage)[1]
00588	Sandstone	C	102	57	45	0	45	100
00590	Sand Draw	I	250	54	196	0	196	100
00593	Hamilton Rim	M	59	0	59	100	159	37
00594	Buffalo Basin	M	462	73	389	167	556	70
00595	Iron Creek	M	538	128	410	116	526	78
00596	Wagonhound	I	1,541	380	1,161	435	1,596	73
00599	Gooseberry	M	599	44	555	2,220	2,775	20
00600	Wall Rock	M	581	48	533	948	1,481	36
00601	Mormon Creek	M	107	0	107	716	823	13
00604	Dickie	I	23,191	7,061	16,130	8,008	24,138	67
00607	Lake Creek	I	734	0	734	532	1,266	58
00608	Vass	C	172	72	100	133	233	43
00609	Owl Creek	I	376	88	288	612	900	32
00610	South Owl Creek	I	156	47	109	38	147	74
00611	Neves Individual	I	7	0	7	0	7	NLTN[2]
00612	South Tatman	I	176	0	176	207	383	46
00613	Putney Flat	M	180	0	180	349	529	34
00614	Rattlesnake	I	195	56	139	163	302	46
00615	Lime Ridge	I	230	0	230	427	657	35
00616	Home	M	439	61	378	107	485	78
00617	Gloyd Individual	M	22	12	10	0	10	100
00618	North Blackstone	C	179	61	118	0	118	100
00619	Elk Creek	I	2,198	760	1,438	92	1,530	94
00620	Prospect	I	1,400	195	1,205	567	1,772	68
00621	North Grass Creek	I	361	68	293	88	381	77
00622	South Highway	I	1,726	474	1,252	80	1,332	94
00623	North Highway	C	793	238	555	106	661	84
00626	Timber Creek	I	900	100	800	0	800	100
00627	Rooster Creek	I	956	316	640	884	1,524	42
00628	Hole in the Ground	I	252	0	252	411	663	38
00629	Rankine	C	17	0	17	0	17	NLTN[2]
00633	Upper Pastures	I	1,469	412	1,057	1,145	2,202	48
00634	Lower Pastures	I	1,445	290	1,155	385	1,540	75
00636	Haynes	C	150	19	131	46	177	74
00637	Adam Wiess Peak	I	1,466	400	1,066	549	1,615	66
00638	King Dome	M	1,000	481	519	51	570	91

TABLE 3-2 (continued)
AUTHORIZED GRAZING USE INFORMATION BY ALLOTMENT

Allotment Number	Allotment Name	Selective Management Category	Grazing Preference (AUMs)[1]	Suspended Preference (AUMs)[1]	Active Preference (AUMs)[1]	State and Private (AUM s)	Total Available AUMs	Public Land Use (Percentage)[1]
00639	Tatman Mountain Common	I	1,568	189	1,379	308	1,687	82
00640	Snyder	I	617	0	617	135	752	82
00641	Swing Individual	C	56	21	35	17	52	67
00643	Buchanan	M	594	49	545	96	641	85
00644	Tanner	M	675	108	567	221	788	72
00645	South Coal Draw	M	646	101	545	256	801	68
00646	Back of Rim	M	794	159	635	235	870	73
00647	Steer	M	406	66	340	160	500	68
00648	Shumway Individual	I	18	0	18	64	82	22
00650	South Gebo Common	M	393	212	181	0	181	100
00651	West Five Mile	M	2,785	1,785	1,000	0	1,000	100
00652	Badger Gulch	I	6,167	4,031	2,136	915	3,051	70
00653	Red Land	C	63	0	63	56	119	53
00654	Ayers Individual	I	125	0	125	356	481	26
00657	West	M	100	10	90	6	96	94
00661	Three Peaks Anchor	I	721	0	721	2,556	3,277	22
00662	Enright	I	2,200	777	1,423	401	1,824	78
00663	Cow Pasture	C	164	0	164	549	713	23
00664	Alamo Creek	I	55	30	25	0	25	100
00665	Nelson	M	1,230	369	861	202	1,063	81
00668	Dorsey Creek	C	695	190	505	0	505	100
00669	Allen Basin	I	2,522	1,687	835	309	1,144	73
00670	Upper Fifteenmile	C	277	76	201	857	1,058	19
00671	Tenmile	I	2,480	829	1,651	34	1,685	98
00672	Mountain	I	427	0	427	697	1,124	38
00674	North Tatman	C	1,800	740	1,060	0	1,060	100
00676	Pitchfork	I	1,965	778	1,187	0	1,187	100
00678	South Grass Creek	I	1,686	197	1,489	710	2,199	68
00679	North Rim	M	168	57	111	32	143	78
00680	Lake Creek Pasture	C	76	0	76	874	950	NLTN[2]
00681	Spring Creek	I	201	0	201	408	609	33
00682	Hunt Oil 15Mile	I	1,420	0	1,420	123	1,543	92
00683	South Sleeper	I	1,225	0	1,225	167	1,392	88
00684	South Greybull	C	12	0	12	0	12	NLTN[2]
00720	Putney Place	C	109	0	109	0	109	NLTN[2]
00721	Urwin Homestead	C	25	0	25	0	25	NLTN[2]

TABLE 3-2 (continued)
AUTHORIZED GRAZING USE INFORMATION BY ALLOTMENT

Allotment Number	Allotment Name	Selective Management Category	Grazing Preference (AUMs)[1]	Suspended Preference (AUMs)[1]	Active Preference (AUMs)[1]	State and Private (AUM s)	Total Available AUMs	Public Land Use (Percentage)[1]
00722	Wales Homestead	C	24	0	24	0	24	NLTN[2]
01065	YU Bench	I	18	0	18	0	18	NLTN[2]
01077	Lower	C	10	6	4	0	4	NLTN[2]
02501	Arapahoe Ranch	C	161	0	161	0	161	NLTN[2]
02505	Lower Red Canyon	I	395	0	395	250	420	94
02510	Gould Individual	I	347	0	347	61	408	85
02511	Gould Individual [Split]	M	127	0	127	0	127	NLTN[2]
02522	Kruger Sec. 15	M	26	0	26	0	26	NLTN[2]
02534	Renner Sec. 15	I	37	0	37	0	37	NLTN[2]
02539	Red Canyon	I	1,356	350	1,006	1,006	2,012	50
02555	Lawler Sec. 15	C	115	0	115	0	115	NLTN[2]
02562	Meeteetse-East	M	131	0	131	439	570	23
02563	Larson Sec. 15	M	78	0	78	0	78	NLTN[2]
03033	Hogg	C	80	0	80	0	80	NLTN[2]
PLANNING AREA TOTALS			**143,140**	**41,689**	**101,451**	**55,904**	**157,355**	

[1]Some allotments include federal land surface within grazing allotments administered by the BLM, the FS, the BOR, and the BIA. This RMP will not make planning decisions affecting lands not administered by the BLM.

[2]NLTN (Not limited to time or numbers) identifies unspecified AUM use when an allotment contains a small amount of public land and the percentage of public land use has not been determined by BLM. Therefore, the state and private AUMs being used also are not determined and are unknown.

APPENDIX 3

TABLE 3-3
AVERAGE ACTUAL GRAZING USE BY ALLOTMENT

Allotment Number	Number of Permittees	Kind of Livestock	Season of Use	Average Actual Use for Five-Year Period 1987-1991 (Public AUMs)	Average Actual Use for Five-Year Period 1976-1980 (Public AUMs)	Average Actual Use for Both Five-Year Periods (Public AUMs)
00063	1	C	6/1 TO 6/30	11	11	11
00503	2	C	9/13 TO 11/15	0	193	97
00504	2	H	4/1 TO 11/15	629	805	717
		C	12/16 TO 2/10			
		C	5/10 TO 6/10			
00506	2	C	5/10 TO 9/15	70	58	64
00507	8	C	4/20 TO 12/2	1,720	3,420	2,570
		S	4/1 TO 4/20			
00508	8	C	4/16 TO 1/21	3,042	5,160	4,101
		S	5/1 TO 4/30			
00509	9	C	5/1 TO 10/31	2,124	3,055	2,590
		S	5/5 TO 6/20			
		S	10/10 TO 2/19			
00510	2	C	5/16 TO 10/15	706	515	611
00511	1	C	10/28 TO 2/12	28	30	29
00512	2	C	5/1 TO 9/29	72	535	304
00513	2	C	7/16 TO 10/25	35	80	58
00515	1	C	6/16 TO 9/30	781	853	817
00516	2	C	7/15 TO 9/15	11	199	105
00519	1	C	6/1 TO 6/30	84	125	105
		C	10/1 TO 10/16			
00520	1	C	NLTN[1]	17	21	19
00521	1	C	11/16 TO 1/31	162	254	208
00522	1	C	4/25 TO 6/19	403	560	482
		C	9/01 TO 10/15			
		C	12/16 TO 12/31			
00523	1	C	5/6 TO 7/5	474	664	569
00524	1	C	6/15 TO 10/19	131	285	208
00525	1	C	6/27 TO 9/15	84	355	220
00526	2	C	6/15 TO 11/15	486	787	637
00527	1	C	6/1 TO 9/12	98	171	135
00528	1	S	12/1 TO 1/10	54	0	27
00529	3	C	3/1 TO 4/15	639	1,090	865
		C	5/21 TO 2/28			
00530	1	C	6/3 TO 11/6	215	315	265
00531	1	C	4/16 TO 5/20	215	295	255
00532	1	C	7/14 TO 10/22	63	76	70
		H	7/1 TO 9/30			
00533	1	C	5/1 TO 7/13	83	121	102
		H	5/1 TO 6/30			
00534	1	C	2/1 TO 3/15	170	269	220
00535	1	C	11/1 TO 1/31	328	497	413
00536	1	C	4/16 TO 5/31	42	210	126
00537	1	C	4/16 TO 6/15	190	336	263
00538	1	C	2/1 TO 3/15	118	127	123

TABLE 3-3 (continued)
AVERAGE ACTUAL GRAZING USE BY ALLOTMENT

Allotment Number	Number of Permittees	Kind of Livestock	Season of Use	Average Actual Use for Five-Year Period 1987-1991 (Public AUMs)	Average Actual Use for Five-Year Period 1976-1980 (Public AUMs)	Average Actual Use for Both Five-Year Periods (Public AUMs)
00539	1	C	5/1 TO 7/16	99	125	112
00540	1	C	5/15 TO 6/30	155	156	156
		C	9/16 TO 11/2			
00541	1	C	7/1 TO 9/30	30	18	24
00543	1	C	5/16 TO 8/15	65	63	64
00544	1	C	5/1 TO 5/31	0	13	7
00545	1	C	5/15 TO 12/31	372	637	505
00546	1	C	5/1 TO 10/03	108	107	108
00548	1	C	5/10 TO 10/12	30	121	76
00549	1	C	9/1 TO 9/30	22	26	24
00551	1	C	5/1 TO 6/7	331	360	346
		C	10/30 TO 11/2			
00552	1	C	6/16 TO 6/30	82	104	93
		C	9/30 TO 11/25			
		H	6/1 TO 12/15			
00553	1	C	6/11 TO 7/31	590	597	594
		C	10/1 TO 12/23			
		H	12/16 TO 2/28			
00554	1	C	5/1 TO 6/15	74	138	106
00556	1	C	8/1 TO 9/30	316	321	319
00557	1	C	NLTN[1]	18	18	18
00558	1	C	6/21 TO 9/23	93	95	94
00559	1	C	5/1 TO 1/16	71	324	198
00560	1	C	7/1 TO 10/14	105	9	57
00561	1	C	5/1 TO 6/1	119	267	193
		C	9/15 TO 1/5			
00564	1	C	6/10 TO 8/24	282	561	422
00566	1	C	5/27 TO 10/31	74	216	145
00567	1	C	11/1 TO 12/30	33	246	140
00568	1	C	6/1 TO 10/15	1,046	1,090	1,068
00569	1	C	3/1 TO 12/31	561	558	560
00572	1	C	5/11 TO 11/30	335	437	386
00573	1	C	8/16 TO 11/30	328	417	373
00574	1	C	11/1 TO 2/6	358	771	565
00575	1	C	6/25 TO 9/9	91	196	144
00576	1	S	4/16 TO 6/20	174	320	247
		S	1/20 TO 2/28			
00577	1	S	4/16 TO 6/20	515	193	354
		S	10/22 TO 12/31			
00578	1	C	5/1 TO 9/20	155	230	193
	1	S	10/1 TO 10/21			
00579	1	C	4/16 TO 12/30	1,053	1,384	1,219
		S	5/1 TO 6/30			
00580	1	C	5/10 TO 8/14	74	93	84
00582	1	C	11/3 TO 11/13	52	68	60

APPENDIX 3

TABLE 3-3 (continued)
AVERAGE ACTUAL GRAZING USE BY ALLOTMENT

Allotment Number	Number of Permittees	Kind of Livestock	Season of Use	Average Actual Use for Five-Year Period 1987-1991 (Public AUMs)	Average Actual Use for Five-Year Period 1976-1980 (Public AUMs)	Average Actual Use for Both Five-Year Periods (Public AUMs)
00583	1	C	NLTN[1]	21	21	21
00584	1	C	NLTN[1]	32	9	21
00585	1	C	3/1 TO 4/30	78	75	77
	1	C	11/15 TO 2/28			
	1	H	3/1 TO 4/30			
	1	H	11/12 TO 2/28			
00586	1	C	NLTN[1]	16	9	13
00587	1	C	NLTN[1]	48	30	39
00588	1	C	11/1 TO 12/30	9	64	37
00590	1	C	7/16 TO 9/12	131	142	137
00593	1	H	11/01 TO 2/28	52	60	56
00594	1	C	5/8 TO 8/6	397	377	387
00595	1	C	8/7 TO 10/29	409	410	410
00596	1	C	5/1 TO 6/26	477	1,237	857
		C	9/16 TO 10/31			
		C	12/16 TO 2/28			
00599	1	C	3/1 TO 6/15	559	513	536
		C	11/16 TO 2/28			
00600	1	C	6/16 TO 11/15	535	533	534
00601	1	C	6/16 TO 11/15	107	107	107
00604	1	C	3/1 TO 2/28	10,032	13,901	11,967
		H	3/1 TO 2/28			
		S	11/1 TO 12/31			
00607	1	C	5/1 TO 2/14	670	736	703
00608	1	C	9/1 TO 2/28	107	100	104
00609	1	C	7/1 TO 8/31	145	264	205
00610	1	C	5/16 TO 10/15	83	108	96
00611	1	C	NLTN[1]	7	10	9
00612	1	S	10/15 TO 12/2	140	99	120
00613	1	C	4/26 TO 5/25	138	136	152
		C	10/1 TO 1/13			
00614	1	C	5/10 TO 9/30	80	139	110
00615	1	C	6/21 TO 10/17	171	242	207
00616	1	C	4/15 TO 7/7	160	283	222
		H	5/21 TO 9/3			0
00617	1	C	9/1 TO 11/15	4	10	7
00618	1	H	12/1 TO 02/28	76	96	86
00619	1	S	4/16 TO 6/10	50	88	69
		S	11/1 TO 1/31			
00620	1	C	6/16 TO 10/30	703	1,249	976
00621	1	C	6/1 TO 10/31	249	309	279
00622	1	C	4/16 TO 5/15	514	1,045	780
		C	9/15 TO 11/30			0
00623	1	C	12/1 TO 2/28	393	544	469
00626	1	C	5/1 TO 9/29	712	800	756

TABLE 3-3 (continued)
AVERAGE ACTUAL GRAZING USE BY ALLOTMENT

Allotment Number	Number of Permittees	Kind of Livestock	Season of Use	Average Actual Use for Five-Year Period 1987-1991 (Public AUMs)	Average Actual Use for Five-Year Period 1976-1980 (Public AUMs)	Average Actual Use for Both Five-Year Periods (Public AUMs)
00627	1	C	5/3 TO 10/25	613	639	626
		H	5/1 TO 10/20			
00628	1	C	6/1 TO 10/31	167	252	210
00629	1	C	NLTN[1]	17	17	17
00633	1	C	6/1 TO 10/12	1,225	1,180	1,203
00634	1	C	5/1 TO 5/31	1,172	1,977	1,575
		C	10/13 TO 12/14			0
00636	1	C	5/1 TO 5/10	19	131	75
00637	1	C	7/18 TO 1/10	475	1,068	772
00638	1	C	10/16 TO 1/31	261	289	275
00639	3	C	5/16 TO 10/31	86	1,580	833
00640	1	C	6/1 TO 10/31	95	595	345
00641	1	C	7/1 TO 10/15	28	22	25
00643	1	C	10/1 TO 12/11	353	543	448
00644	1	C	10/27 TO 12/22	489	606	548
00645	1	C	11/1 TO 2/28	153	545	349
00646	1	C	11/1 TO 2/28	206	635	421
00647	1	C	11/1 TO 2/28	132	340	236
00648	1	C	5/1 TO 7/15	14	18	16
00650	2	C	9/1 TO 11/15	61	164	113
00651	1	C	10/1 TO 2/28	0	1,739	870
00652	1	S	11/1 TO 3/31	0	1,086	543
00653	1	C	6/1 TO 11/30	34	64	49
		H	6/1 TO 11/30			
00654	1	C	5/1 TO 7/31	126	125	126
		C	10/01 TO 12/31			
00657	1	C	9/1 TO 11/15	48	90	69
00661	1	C	6/8 TO 10/22	495	761	628
		H	3/1 TO 12/31			0
00662	1	C	4/15 TO 9/30	641	1,371	1,006
00663	1	C	6/1 TO 10/31	123	163	143
00664	1	C	5/1 TO 6/30	5	26	16
00665	1	C	9/16 TO 2/28	727	817	772
00668	1	S	11/1 TO 11/15	25	78	52
00669	1	S	11/1 TO 3/31	333	226	280
00670	1	C	10/1 TO 4/30	126	140	133
00671	1	S	11/16 TO 4/30	645	1,110	878
00672	1	C	6/26 TO 10/4	300	426	363
00674	1	S	5/10 TO 7/9	0	288	144
		S	11/1 T0 2/20			
00676	1	S	11/1 TO 3/31	101	223	162
00678	1	Y	5/15 TO 6/14	923	1,248	1,013
		C	5/1 TO 12/18			0
00679	1	C	9/1 TO 9/30	106	118	105
		Y	9/1 TO 10/17			
		H	3/1 TO 2/28			

TABLE 3-3 (continued)
AVERAGE ACTUAL GRAZING USE BY ALLOTMENT

Allotment Number	Number of Permittees	Kind of Livestock	Season of Use	Average Actual Use for Five-Year Period 1987-1991 (Public AUMs)	Average Actual Use for Five-Year Period 1976-1980 (Public AUMs)	Average Actual Use for Both Five-Year Periods (Public AUMs)
00680	1	C	NLTN[1]	120	76	98
00681	1	C	5/16 TO 6/15	166	200	183
		C	10/23 TO 10/29			
00682	1	S	11/15 TO 2/11	0	395	198
00683	1	C	5/1 TO 8/15	1,096	406	751
		S	2/15 TO 2/28			
00684	1	C	NLTN[1]	12	85	49
00720	1	H	NLTN[1]	87	109	98
00721	1	H	NLTN[1]	19	25	22
00722	1	H	NLTN[1]	19	24	22
01065	1	C	NLTN[1]	18	15	17
		H				
01077	1	C	NLTN[1]	13	4	9
02501	1	C	NLTN[1]	159	161	160
02505	1	C	10/30 TO 2/28	515	262	345
02510	1	C	6/10 TO 9/22	249	347	298
02511	1	C	NLTN[1]	153	127	140
02522	1	C	NLTN[1]	5	26	16
02539	1	C	4/15 TO 12/1	498	1,355	927
02555	1	C	NLTN[1]	116	115	116
02562	1	C	5/15 TO 11/14	131	131	131
		S	5/15 TO 11/14			
02563	1	C	NLTN[1]	77	78	78
03033	1	C	NLTN[1]	80	80	80
TOTALS				**52,294**	**80,254**	**66,167**

[1]NLTN (Not limited to time or numbers) identifies unspecified AUM use when an allotment contains a small amount of public land and the percentage of public land use has not been determined by BLM. Therefore, the state and private AUMs being used also are not determined and are unknown.

TABLE 3-4
ECOLOGICAL CONDITION CLASS AND ACREAGE OF PUBLIC LAND BY ALLOTMENT

Allotment Number	Early Seral (Poor) (Acres)	Mid Seral (Fair) (Acres)	Late Seral (Good) (Acres)	Potential Natural Community (Excellent) (Acres)	Unclassified (e.g., rock outcrops, commercial forestland) (Acres)	No Range Site Mapping Data (Acres)	Total Acres
00063	0	0	0	0	0	100	100
00503	4,052	282	0	0	1,360	0	5,694
00504	387	5,730	3,389	0	1,619	0	11,125
00506	0	391	347	0	227	0	965
00507	8,630	28,758	16,354	0	4,726	0	58,468
00508	7,181	42,973	47,067	1,176	15,408	0	113,805
00509	1,767	26,677	31,976	851	32,285	0	93,556
00510	33	2,122	4,771	0	1,986	0	8,912
00511	0	109	96	0	47	0	252
00512	0	5,455	3,637	0	2,424	0	11,516
00513	424	29	32	0	256	0	741
00515	0	40	446	0	1,161	1,654	3,301
00516	0	0	885	0	1,003	0	1,888
00519	0	88	74	0	383	0	545
00520	0	0	0	0	0	124	124
00521	5,567	322	0	0	677	0	6,566
00522	3,938	3,785	0	0	1,271	0	8,994
00523	130	2,244	2,860	0	356	0	5,590
00524	0	922	84	0	196	0	1,202
00525	1,579	1,093	0	0	1,639	0	4,311
00526	15	368	2,697	0	251	0	3,331
00527	0	0	620	0	177	0	797
00528	0	1,358	408	0	0	0	1,766
00529	0	1,838	4,649	0	1,345	0	7,832
00530	0	1,640	67	0	112	0	1,819
00531	0	179	1,738	0	65	0	1,982
00532	0	302	0	0	54	0	356
00533	0	670	247	0	21	0	938
00534	1,266	1,296	518	0	333	0	3,413
00535	0	3,825	1,890	0	1,398	0	7,113
00536	0	0	701	0	181	0	882
00537	0	1,110	888	0	259	0	2,257
00538	1,116	209	1,103	0	172	0	2,600
00539	0	193	146	0	0	0	339
00540	0	115	430	0	212	0	757
00541	0	160	0	0	825	0	985
00543	21	126	675	0	106	0	928
00544	0	55	50	0	22	0	127
00545	63	2,344	1,289	0	442	0	4,138
00546	358	467	90	0	234	0	1,149
00548	359	1,334	25	0	185	0	1,903
00549	2	295	12	0	71	0	380
00551	0	210	2,089	0	162	0	2,461
00552	0	320	11	0	51	0	382

TABLE 3-4 (continued)
ECOLOGICAL CONDITION CLASS AND ACREAGE OF PUBLIC LAND BY ALLOTMENT

Allotment Number	Early Seral (Poor) (Acres)	Mid Seral (Fair) (Acres)	Late Seral (Good) (Acres)	Potential Natural Community (Excellent) (Acres)	Unclassified (e.g., rock outcrops, commercial forestland) (Acres)	No Range Site Mapping Data (Acres)	Total Acres
00553	201	2,658	865	0	210	0	3,934
00554	242	929	1,009	0	75	0	2,255
00556	0	1,247	336	0	225	0	1,808
00557	37	82	8	0	8	0	135
00558	0	305	0	0	183	0	488
00559	0	831	699	0	358	0	1,888
00560	83	308	0	0	695	0	1,086
00561	67	758	587	0	523	0	1,935
00564	0	586	1,453	0	238	0	2,277
00566	0	1,680	35	0	311	0	2,026
00567	0	1,410	705	0	345	0	2,460
00568	609	4,624	334	0	2,960	0	8,527
00569	31	2,271	927	0	159	0	3,388
00572	0	199	1,332	0	351	0	1,882
00573	370	2,697	244	0	167	0	3,478
00574	163	1,716	2,880	998	794	0	6,551
00575	550	374	0	0	92	0	1,016
00576	2,195	1,937	1,676	8	2,519	0	8,335
00577	215	1,944	7,582	0	2,873	0	12,614
00578	0	900	3,566	0	926	0	5,392
00579	0	4,804	4,072	0	311	0	9,187
00580	0	64	365	0	41	0	469
00582	0	44	284	0	76	0	404
00583	0	0	0	0	0	182	182
00584	0	0	0	0	0	121	121
00585	0	236	265	0	60	0	561
00586	0	28	51	0	6	0	85
00587	0	0	0	0	0	254	254
00588	31	331	80	0	94	0	536
00590	2,063	0	0	0	693	0	2,756
00593	0	283	195	0	92	0	570
00594	0	795	405	0	169	0	1,369
00595	0	470	743	0	99	0	1,312
00596	840	5,470	498	0	1,390	0	8,198
00599	0	0	0	0	0	3,108	3,108
00600	0	0	0	0	0	1,084	1,084
00601	0	0	0	0	0	307	307
00604	5,059	38,567	41,039	848	16,035	0	101,548
00607	0	1,512	1,528	0	581	0	3,621
00608	0	551	89	0	53	0	693
00609	0	1,276	0	0	591	0	1,867
00610	0	735	14	0	139	0	888
00611	0	0	0	0	0	67	67

TABLE 3-4 (continued)
ECOLOGICAL CONDITION CLASS AND ACREAGE OF PUBLIC LAND BY ALLOTMENT

Allotment Number	Early Seral (Poor) (Acres)	Mid Seral (Fair) (Acres)	Late Seral (Good) (Acres)	Potential Natural Community (Excellent) (Acres)	Unclassified (e.g., rock outcrops, commercial forestland) (Acres)	No Range Site Mapping Data (Acres)	Total Acres
00612	0	1,738	266	0	237	0	2,241
00613	0	0	705	0	112	0	817
00614	0	241	377	0	171	0	789
00615	0	530	0	0	429	0	959
00616	0	305	3,161	0	385	0	3,851
00617	0	106	0	0	13	0	119
00618	0	390	81	0	228	0	699
00619	1,090	549	13,300	201	4,373	0	19,513
00620	0	2,267	1,954	0	735	0	4,956
00621	0	1,817	499	0	32	0	2,348
00622	783	7,232	700	0	262	0	8,977
00623	0	773	4,756	0	1,126	0	6,655
00626	6,371	0	0	0	1,727	0	8,098
00627	0	2,250	39	0	728	0	3,017
00628	0	843	94	0	1,047	0	1,984
00629	0	0	0	0	0	18	18
00633	304	3,284	344	0	531	0	4,463
00634	7	2,955	4,971	0	2,065	0	9,998
00636	0	455	0	0	0	0	455
00637	438	1,822	1,233	0	188	0	3,681
00638	0	1,549	2,536	0	656	0	4,741
00639	143	9,131	3,459	130	5,123	0	17,986
00640	0	5,753	1,686	0	3,679	0	11,118
00641	95	374	0	0	3	0	472
00643	978	853	1,454	0	73	0	3,358
00644	1,318	1,576	402	0	970	0	4,266
00645	26	1,450	2,300	0	962	0	4,738
00646	0	2,204	2,093	0	926	0	5,223
00647	0	1,325	443	0	321	0	2,089
00648	0	289	0	0	68	0	357
00650	302	1,111	419	0	25	0	1,857
00651	21	10,348	22,065	0	7,436	0	39,870
00652	869	7,534	6,358	876	3,227	0	18,864
00653	0	140	278	0	218	0	636
00654	25	286	283	0	15	0	609
00657	0	227	740	0	2	0	969
00661	255	3,252	585	0	2,622	0	6,714
00662	0	1,583	5,088	0	2,937	0	9,608
00663	0	524	1,160	0	265	0	1,949
00664	0	163	137	0	28	0	328
00665	9,558	1,645	0	0	3,063	0	14,266
00668	122	7,582	1,273	17	1,082	0	10,076
00669	539	4,744	4,466	391	2,760	0	12,900

TABLE 3-4 (continued)
ECOLOGICAL CONDITION CLASS AND ACREAGE OF PUBLIC LAND BY ALLOTMENT

Allotment Number	Early Seral (Poor) (Acres)	Mid Seral (Fair) (Acres)	Late Seral (Good) (Acres)	Potential Natural Community (Excellent) (Acres)	Unclassified (e.g., rock outcrops, commercial forestland) (Acres)	No Range Site Mapping Data (Acres)	Total Acres
00670	0	0	0	0	0	441	441
00671	282	5,399	15,993	0	2,525	0	24,199
00672	0	174	321	0	507	0	1,002
00674	0	2,818	3,924	0	2,721	0	9,463
00676	95	2,413	6,788	339	4,600	0	14,235
00678	0	3,552	4,265	0	1,251	0	9,068
00679	0	127	369	0	425	0	921
00680	0	0	0	0	0	758	758
00681	0	984	166	0	461	0	1,611
00682	1,394	1,094	6,594	0	7,025	0	16,107
00683	138	314	3,674	0	540	0	4,666
00684	0	0	0	0	0	410	410
00720	3	347	67	0	37	0	454
00721	0	105	47	0	15	0	167
00722	0	0	96	0	12	0	108
01065	0	0	0	0	0	36	36
01077	2	61	0	0	1	0	64
02501	0	77	388	0	0	0	465
02505	0	996	866	0	399	0	2,261
02510	0	1,000	1,073	0	237	0	2,310
02511	0	0	0	0	0	93	93
02522	0	0	0	0	0	80	80
02534[1]	0	0	0	0	0	0	0
02539	1,357	1,522	2,763	0	838	0	6,480
02555	0	165	584	0	271	174	1,194
02562	0	0	0	0	0	984	984
02563	0	0	0	0	0	515	515
03033	0	200	400	0	532	0	1,132
Total Acres in Planning Area	**76,159**	**334,604**	**344,310**	**5,835**	**181,390**	**10,510**	**952,808**

[1]This allotment is on Bureau of Reclamation land that is administered by the BLM.

APPENDIX 3

TABLE 3-5
COMPARISON OF STOCKING LEVELS, ACTUAL USE, AND SUITABILITY BY ALLOTMENT[1]

Allotment Number	(A) Total Authorized Grazing Use AUMs	(B) Average Actual Use AUMs	(C) Recommended Stocking Level (AUMs)	(D) Suitable AUMs	(E) Percentage Total Available AUMs versus Suitable AUMs [A ÷ D = E]	(F) Percentage Average Actual Use AUMs vs. Suitable AUMs [B ÷ D = F]
00063	11	11				
00503	468	110	376	282	166	39
00504	891	800	1,475	1,342	66	60
00506	98	64	135	126	78	51
00507	4,895	2,780	6,576	3,814	128	73
00508	9,395	4,523	9,253	8,143	115	56
00509	7,649	2,727	5,249	3,412	224	80
00510	1,047	766	980	892	117	86
00511	63	56	81			
00512	702	320	856	719	98	44
00513	80	58	32	24	329	236
00515	5,425	5,106				
00516	305	381	1,090	1,014	30	38
00519	450	373	164	112	404	335
00520	21					
00521	472	239	382	149	317	160
00522	1,232	625	792	744	165	84
00523	745	639	948	711	105	90
00524	663	484	462	434	153	111
00525	1,000	1,098	1,344	1,089	92	101
00526	935	757	672	652	143	116
00527	171	135	98	74	230	181
00528	134	27	181	181	74	15
00529	1,857	1,330	1,729	1,452	127	92
00530	864	679	523	502	172	135
00531	295	255	330	254	116	100
00532	239	211	125	125	192	168
00533	176	136	198	192	92	71
00534	708	457	757	727	97	63
00535	1,688	859	1,690	1,487	113	58
00536	469	263	463	384	122	68
00537	1,244	641	843	725	172	88
00538	208	123	368	346	60	35
00539	128	114	168	161	79	71
00540	679	555	280	227	299	245
00541	300	120	59	33	908	363
00543	59	65	113	50	119	131
00544	13	7	9	9	144	72
00545	804	742	919	781	103	95
00546	107	108	131	113	95	95
00548	174	87	129	88	198	99
00549	39	26	27	27	144	96
00551	536	376	585	550	97	68
00552	292	251	194	192	152	131

TABLE 3-5 (continued)
COMPARISON OF STOCKING LEVELS, ACTUAL USE, AND SUITABILITY BY ALLOTMENT[1]

Allotment Number	(A) Total Authorized Grazing Use AUMs	(B) Average Actual Use AUMs	(C) Recommended Stocking Level (AUMs)	(D) Suitable AUMs	(E) Percentage Total Available AUMs versus Suitable AUMs [A ÷ D = E]	(F) Percentage Average Actual Use AUMs vs. Suitable AUMs [B ÷ D = F]
00553	966	957	1,033	930	104	103
00554	155	119	347	309	50	39
00556	405	403	291	288	141	140
00557	18		41			
00558	306	303	160	150	204	202
00559	411	203	399	331	124	61
00560	299	74	90	13	2,371	588
00561	609	439	631	599	102	73
00564	562	422	471	457	123	92
00566	245	163	250	215	114	76
00567	196	145	283	252	78	58
00568	2,897	2,886	2,635	1,950	149	148
00569	2,963	2,960	2,710	2,412	123	123
00572	667	585	500	475	140	123
00573	953	631	890	872	109	72
00574	1,155	706	1,209	1,124	103	63
00575	841	531	431	336	250	158
00576	815	247	368	92	886	268
00577	916	373	868	642	143	58
00578	200	261	501	331	60	79
00579	2,420	2,031	2,352	1,929	125	105
00580	237	204	156	133	178	154
00582	314	286	296	275	114	104
00583	21					
00584	1,600	1,025				
00585	205	201	218	209	98	96
00586	129	179	131	121	107	148
00587	176	229				
00588	45	37	40	11	402	326
00590	196	137	131	98	199	139
00593	159	151				
00594	556	553	417	342	163	162
00595	526	525	454	445	118	118
00596	1,596	1,178	1,068	886	180	133
00599	2,775	2,680				
00600	1,481	1,483				
00601	823	823				
00604	24,138	17,907	23,541	19,068	127	94
00607	1,266	1,212	1,181	1,122	113	108
00608	233	241	227	218	107	110
00609	900	639	726	443	203	144
00610	147	129	116	110	134	117
00611	7					

TABLE 3-5 (continued)
COMPARISON OF STOCKING LEVELS, ACTUAL USE, AND SUITABILITY BY ALLOTMENT[1]

Allotment Number	(A) Total Authorized Grazing Use AUMs	(B) Average Actual Use AUMs	(C) Recommended Stocking Level (AUMs)	(D) Suitable AUMs	(E) Percentage Total Available AUMs versus Suitable AUMs [A ÷ D = E]	(F) Percentage Average Actual Use AUMs vs. Suitable AUMs [B ÷ D = F]
00612	383	260	199	84	458	311
00613	529	271	482	477	111	57
00614	302	238	366	355	85	67
00615	657	590	325	254	259	233
00616	485	284	625	444	109	64
00617	10	7	17	17	59	41
00618	118	124	118	104	113	119
00619	1,530	73	1,277	217	705	34
00620	1,772	1,435	1,021	766	231	187
00621	381	362	431	284	134	127
00622	1,332	829	786	715	186	116
00623	661	558	500	385	172	145
00626	800	756	326	300	267	252
00627	1,524	1,490	916	641	238	232
00628	663	551	559	358	185	154
00629	17					
00633	2,202	2,505	1,334	1,294	170	194
00634	1,540	2,099	1,795	1,616	95	130
00636	177	101	90	78	226	129
00637	1,615	1,169	820	722	224	162
00638	570	302	852	733	78	41
00639	1,687	1,019	1,435	861	196	118
00640	752	421	1,544	1,050	72	40
00641	52	37	130	127	41	29
00643	641	527	432	415	155	127
00644	788	821	591	514	153	160
00645	801	513	928	882	91	58
00646	870	576	978	694	125	83
00647	500	347	392	325	154	107
00648	82	73	81	79	104	93
00650	181	113	235	233	78	48
00651	1,000	870	2,603	2,160	46	40
00652	3,051	776	1,980	1,703	179	46
00653	119	92	145	144	83	64
00654	481	483	384	334	144	144
00657	96	73	190	190	50	39
00661	3,277	2,855	3,053	2,717	121	105
00662	1,824	1,290	884	663	275	195
00663	713	622	986	966	73	64
00664	25	16	42	16	153	95
00665	1,063	953	953	696	153	137
00668	505	52	623	87	579	59
00669	1,144	383	871	697	164	55
00670	1,058	700				

TABLE 3-5 (continued)
COMPARISON OF STOCKING LEVELS, ACTUAL USE, AND SUITABILITY BY ALLOTMENT[1]

Allotment Number	(A) Total Authorized Grazing Use AUMs	(B) Average Actual Use AUMs	(C) Recommended Stocking Level (AUMs)	(D) Suitable AUMs	(E) Percentage Total Available AUMs versus Suitable AUMs [A ÷ D = E]	(F) Percentage Average Actual Use AUMs vs. Suitable AUMs [B ÷ D = F]
00671	1,685	895	2,160	2,009	84	45
00672	1,124	955	466	438	257	218
00674	1,060	144	705	529	200	27
00676	1,187	162	974	731	162	22
00678	2,199	1,496	1,644	1,365	161	110
00679	143	135	159	151	95	90
00680	950	1,225				
00681	609	555	770	531	115	104
00682	1,543	215	897	350	441	61
00683	1,392	853	1,161	1,057	132	81
00684	12					
00720	109		273			
00721	25		122			
00722	24		104			
01065	18					
01077	4		7			
02501	161		186			
02505	420	367	363	352	119	104
02510	408	350	765	696	59	50
02511	127					
02522	26					
02534	37					
02539	2,012	1,853	1,718	1,477	136	125
02555	115					
02562	570	570				
02563	78					
03033	80		268			
TOTALS	**157,355**	**111,092**	**130,989**	**104,612**		

[1]Missing data indicates that information is not available.

PLANNING AREA MONITORING PLAN

Introduction

Monitoring is used to determine whether management actions are meeting goals and objectives established for allotments.

The Wyoming Rangeland Monitoring Handbook, H-4423-1 establishes when, where, and how studies will be conducted, as well as the types of data to be collected, how the data will be evaluated, and who will participate in the process. The method, amount, and intensity of monitoring for each allotment will depend on allotment category and objectives, resource values, staff availability, and funding. Monitoring data will be stored in the Grass Creek Resource Area allotment files.

High-intensity monitoring will be implemented in the category "I" allotments on a priority basis. Low-intensity monitoring studies will be carried out on "M" and "C" category allotments. This data will determine the effects of management actions on rangeland resources and provide quantifiable data needed to enable the authorized officer to enter into agreements or issue decisions to assure that allotment objectives are achieved. High-intensity monitoring includes actual use, utilization, climate, and trend. Low-intensity studies are those that detect undesirable changes in existing range condition that could warrant reevaluation of the priority or category for that allotment. At a minimum, such studies include an allotment inspection at least every five years.

Actual Use

Dates, numbers, and kinds of livestock grazed in an allotment comprise actual use. The information may be reported by permittees and verified by BLM livestock counts. Actual use by wildlife can be obtained from aerial or ground observations.

Utilization

Utilization is the percentage of forage that has been consumed or destroyed during a specific period. By comparing measured utilization with appropriate use levels for key forage plants, and by comparing utilization with actual use, climate, and trend data, short- and long-term stocking level adjustments can be made.

Utilization monitoring provides an index to the amount of the current year's standing crop that remains on the range following grazing. This standing crop helps maintain soil productivity, livestock diet quality, wildlife habitat, and forage plant vigor. Utilization data will be collected on key forage plants in key areas along permanent transects. Additional utilization data, such as maps showing patterns of use, may be collected to provide an estimate of forage utilization on a pasture or allotment.

Utilization will be measured on the standing vegetation in a pasture or allotment at the end of the grazing period. Although some regrowth may occur after the grazing period, it will not be measured in utilization monitoring. In most cases, this regrowth is relatively small.

The following utilization levels are generally considered to be appropriate for the precipitation levels, vegetative communities, and grazing seasons described in Table 3-6. These levels will be considered in the development of allotment management plans. Table 3-6 applies specifically to key forage plants in upland areas (not riparian areas). Some exceptions will occur. Data from several studies indicates that underuse in wet years will compensate for overuse in dry years. Although utilization levels may vary widely from year to year, utilization levels which consistently exceed those shown in Table 3-6 would not be expected to meet watershed and vegetation management objectives. Specialized grazing management, such as holistic range management, may require utilization levels different than those shown in Table 3-6.

TABLE 3-6
APPROPRIATE UTILIZATION LEVELS FOR VEGETATIVE COMMUNITIES IN THE PLANNING AREA

Average Annual Precipitation	Appropriate Utilization for Key Forage Key Areas[1] (Percentage)	Vegetative Community	Start of Spring Growth/Start of Dormancy	Appropriate Utilization for Plants Grazed Exclusively During the Dormant Season (Percentage)
5-9"	25-35	Salt Desert Shrub and Salt Bottom	April 11/October 15	60
5-9"	30-50	Basin Grassland/Shrub	April 11/October 15	60
10-14"	30-50	Foothills-Mountain-Grassland/Shrub	May 1/October 15	60
15-19"	30-50	Foothills-Mountain-Grassland/Shrub	May 15/October 10	60
15-19"	30-50	Forested-Mixed Conifer Deciduous	May 15/October 10	60

[1]Ranges in good condition or grazed partially during the dormant season can withstand the higher utilization level. Those in poor condition or those grazed during active plant growth should receive the lower utilization level.

There are few guidelines on appropriate use levels in riparian areas that would maintain ecosystem integrity (Clary and Webster 1989). Because these communities are so variable in the planning area, recommendations on utilization levels for riparian areas will be developed in site-specific activity plans.

Climate/Trend

Climate and actual use information help with the interpretation of utilization data. One way to determine trend is to establish permanent vegetation studies and photo records that can be used periodically to show changes over time as a result of grazing management.

Trend studies, climatic data, actual use, utilization and information from other studies will be used to evaluate the effectiveness of present grazing management over time, and to make necessary adjustments in grazing use. Other monitoring studies include plant phenology, and studies of range readiness and forage production.

Key Area and Key Species Selection

A key area may represent an entire pasture or some other specific area depending on the management objectives. Riparian areas, important wildlife habitat, or a preferred grazing area with heavy use are examples of specific areas. Key areas will be selected when activity plans are developed by consulting with permittees and other affected parties. A key species is relatively or potentially abundant and serves as an indicator of changes occurring in the vegetative community. Several key species could be selected and may be important for watershed, wildlife, or livestock.

A summary of vegetation monitoring data collected since 1982 is shown by allotment in Table 3-7. The "Number of Transects—Trend/Utilization" column shows the permanent trend and utilization transects in established key areas. The utilization transects measure the forage consumed or destroyed by livestock, wildlife, wild horses, insects, etc. The "Other Utilization Transects" column were not in established key areas.

TABLE 3-7
VEGETATION MONITORING DATA COLLECTED BY ALLOTMENT

Allotment Number	Number of Transects		Utilization Pasture Mapping	Other Utilization Transects	Inspection Reports	Photopoints
	Trend	Utilization				
00063			X			
00503			X		X	X
00506					X	
00507			X	X	X	X
00508				X	X	X
00509	4	4	X	X	X	X
00510	3	3	X	X	X	X
00511					X	X
00512					X	
00515				X	X	X
00516	4	4		X		X
00519					X	X
00520					X	
00521					X	
00522	2	2	X	X	X	X
00523			X	X	X	X
00524	3	5	X	X	X	X
00525	3	3	X	X		X
00526			X	X	X	X
00528						X
00529					X	X
00530					X	X
00531					X	X

TABLE 3-7 (continued)
VEGETATION MONITORING DATA COLLECTED BY ALLOTMENT

Allotment Number	Number of Transects		Utilization Pasture Mapping	Other Utilization Transects	Inspection Reports	Photopoints
	Trend	Utilization				
00532					X	X
00534					X	X
00535					X	X
00536					X	X
00537			X	X	X	X
00538					X	
00540					X	X
00541			X	X	X	X
00545	3	3	X		X	X
00551					X	
00552					X	
00553					X	X
00556			X		X	
00558			X	X		
00559					X	X
00560				X	X	X
00564	1	2	X	X		X
00566					X	
00568					X	X
00569			X	X	X	
00572					X	
00573			X	X	X	X
00574					X	
00575					X	X
00577					X	
00578					X	
00579			X	X	X	X
00582					X	
00584				X	X	X
00585					X	X
00586					X	
00587					X	
00590					X	X
00593					X	
00594					X	
00595					X	X
00596	3	3	X		X	X
00599				X	X	X
00600					X	X
00601					X	X
00604	5	5	X	X	X	X
00607					X	X
00609					X	X
00612					X	
00613				X	X	
00614					X	X
00615					X	X
00616					X	X

TABLE 3-7 (continued)
VEGETATION MONITORING DATA COLLECTED BY ALLOTMENT

Allotment Number	Number of Transects		Utilization Pasture Mapping	Other Utilization Transects	Inspection Reports	Photopoints
	Trend	Utilization				
00617					X	
00620	2			X		X
00621	1	1	X	X		X
00622	2					
00623	2					
00626	4		X	X	X	X
00627			X	X	X	X
00628			X	X	X	X
00633	7	7	X			X
00634	8	8	X		X	X
00637		3	X		X	X
00638					X	
00639				X	X	
00640			X	X	X	
00643					X	
00644					X	X
00645					X	X
00646					X	X
00647					X	
00650					X	X
00651					X	
00652	5					
00657					X	X
00661				X	X	X
00662					X	X
00663					X	X
00665	2	2			X	
00669	3				X	
00670					X	X
00671	2	6		X	X	X
00672					X	X
00676	1					
00678	5	4		X		X
00680				X	X	
00681				X	X	
00682	1	1	X			
00683			X		X	X
02501				X	X	X
02505	4	2				X
02510	1	4			X	X
02511					X	X
02522					X	X
02539	6	5			X	
02555					X	X
02562					X	X
02563					X	X
TOTALS	87	77				

The "Inspection Reports" could include observations on utilization, actual use, climate, or trend. The "Photopoints" may or may not be permanent. Utilization pasture mapping, other utilization transects, inspection reports, and photopoints are noted if the information is found for the allotment.

ACTIVITY PLAN IMPLEMENTATION

In cooperation with the permittees and other affected interests, BLM would develop and update activity plans such as Allotment Management Plans (AMPs) for all "I" category allotments.

Each activity plan would: (1) identify general goals based on the RMP; (2) determine existing conditions and resource issues; (3) specify measurable resource objectives; (4) specify management actions designed to achieve resource objectives; (5) identify how progress towards achieving goals and objectives would be monitored; and (6) specify how and when evaluations would be conducted. Interdisciplinary coordination and involvement by affected and interested parties would ensure multiple use management.

Table 3-8 is a status report on completed allotment management plan implementation. Tables 3-9 and 3-10 list the allotments that are scheduled for new activity plans and those scheduled for evaluation of existing activity plans.

GRAZING STRATEGIES

Grazing strategies are based on livestock management needs and the phenology and physiological requirements of key forage plants. The BLM, the permittees, the WGFD, and other affected interests would design grazing strategies based on: (1) livestock handling requirements and economic considerations of the permittee; (2) the development of range projects that enhance the grazing strategy; (3) the current and the desired future condition of the allotment; and (4) establishing the sequence and timing of grazing and resting periods needed to achieve management objectives.

PROCEDURES FOR RANGE DEVELOPMENT PROJECTS

Range projects would be developed with grazing management strategies to achieve resource management objectives. Normally these objectives would be developed in activity plans. Typical projects would be fences, wells, springs, reservoirs, pipelines, catchments, troughs, tanks, and cattleguards and plant treatments such as herbicide application, and prescribed burning.

A number of range projects have been constructed for the enhancement and protection of watershed and wildlife values and for the management of livestock grazing. Many of these projects are vegetative manipulations, water developments, and fencing projects.

Table 3-11 lists the existing range projects by allotment. Fences are not shown by allotment because in many cases they separate allotments. There are a total of 1,424 miles of fence associated with livestock grazing allotments (1,072 miles of allotment boundary fences and 352 miles of pasture fences) in the planning area.

TABLE 3-8
STATUS REPORT OF COMPLETED ALLOTMENT MANAGEMENT PLAN IMPLEMENTATION

ALLOTMENT NAME AND NUMBER	DECISION/AGREEMENT	GOALS	MANAGEMENT CHANGES	MONITORING/EVALUATION
00671--Tenmile	A AMP was signed in 1991.	Maintain or improve antelope habitat while allowing winter sheep use. Replace noxious weeds by increasing native vegetation. Maintain the quality of existing riparian vegetation along Tenmile Creek.	A section of the antelope winter range is held in reserve. Sheep use will be excluded from the antelope winter range in an unusual critical winter. Utilization limits of sagebrush are specified.	Utilization studies are conducted on sagebrush, willows, and cottonwoods. An upland and riparian trend transect were established. The AMP is scheduled for an evaluation in 1996.
02505--Lower Red Canyon	The AMP was signed in 1991.	Improve the riparian habitat along Red Canyon Creek.	Livestock use is established at 420 AUMs. Utilization limits of woody riparian plant species are specified.	Utilization studies are conducted on key herbaceous plants and woody vegetation. An evaluation is scheduled for 1995.
00613--Putney Flat 00614--Rattlesnake 00615--Lime Ridge	A Management Agreement for Rattlesnake and Putney Flat allotments was completed in 1992. An AMP incorporating the three allotments is pending.	Improve range condition in the Rattlesnake Allotment while maintaining conditions in the Putney Flat Allotment.	Spring use is managed in a deferred rotation grazing system.	Utilization and trend studies were established in the Putney Flat and Rattlesnake allotments. An AMP is pending, incorporating the Lime Ridge Allotment.
00633--Upper Pastures 00634--Lower Pastures	A Management Agreement was signed in January 1986. An AMP was finalized in 1991.	Provide for livestock, wildlife, and vegetation/watershed concerns. Improve range condition, forage production, and ground cover. Restore the hydrologic vegetation function of the riparian systems.	Permittee accepted a 30% AUM reduction on the Upper Pastures Allotment and a 15 percent AUM reduction on the Lower Pastures Allotment. Utilization levels were specified. Improvement in pasture rotation and salting practices was also prescribed.	Utilization and trend studies were established in the uplands and riparian areas. An evaluation is scheduled for 1995.

TABLE 8 (Continued)

STATUS REPORT OF COMPLETED ALLOTMENT MANAGEMENT PLAN IMPLEMENTATION

ALLOTMENT NAME AND NUMBER	DECISION/AGREEMENT	GOALS	MANAGEMENT CHANGES	MONITORING/EVALUATION
02539--Red Canyon	An AMP was signed in 1984.	The AMP was revised to maintain the overall cover, vigor, and composition of needle-and-thread grass and bluebunch wheatgrass. Increases in green needlegrass, and Indian ricegrass remains a desirable goal.	Permittee accepted a 27 percent AUM reduction as part of the AMP agreement. The allotment is now managed in a rest rotation grazing strategy.	Utilization and trend studies were established in 1982. An evaluation was completed in 1993. Photopoints have documented improvement of the riparian habitat on Red Creek. An evaluation is scheduled for 1998.
00678--South Grass Creek 00679--North Rim 00620--Prospect	An AMP was signed in January 1987 incorporating the South Grass Creek and North Rim allotments. It was revised in 1990. The AMP will be revised again, to incorporate the addition of the Prospect Allotment.	Allow the South Grass Creek Allotment to support a stable population of livestock, big game, game birds, and non-game populations while improving watershed condition, and adding diversity to the population.	The AMP specifies a five-pasture deferred rotation system. Pasture moves are based on utilization of key species in established key areas. The AMP was revised to employ a best pasture grazing system in an effort to meet the objectives.	An evaluation in 1990 indicates that trend is down. An evaluation is scheduled for 1997.
00596--Wagonhound 00525--Rock Creek	A Management Agreement was signed November 1985. The Agreement was revised in 1991.	Improve range condition in the Wagonhound and Rock Creek Allotments.	The permittee accepted a 25 percent reduction in AUMs on the Wagonhound Allotment and a 60 percent reduction on the Rock Creek Allotment. Forage above 10,000 feet is not allocated to livestock.	Upland trend transects were established in 1982. An evaluation and AMP is scheduled for 1994.

TABLE 8 (Continued)

STATUS REPORT OF COMPLETED ALLOTMENT MANAGEMENT PLAN IMPLEMENTATION

ALLOTMENT NAME AND NUMBER	DECISION/AGREEMENT	GOALS	MANAGEMENT CHANGES	MONITORING/EVALUATION
00652--Badger Gulch 00669--Allen Basin 00676--Pitchfork 00682--Hunt Oil Fifteenmile 00604--Dickie[1]	Livestock use is established as fall-winter sheep. In May 1986, decisions were issued to permittees not using the area in this manner.	These allotments are managed under the Fifteenmile Wild Horse Herd Management Area plan.	It is further stipulated that sheep camps are prohibited from the Fifteenmile riparian drainage.	An evaluation conducted in 1989 indicated static trend and the need to maintain wild horse levels as currently designated.
00545--Grass Point	A CRMP was signed in April 1986.	Improve range condition on two upland key areas. An increase in woody riparian species along Buffalo Creek is needed to increase the overall watershed stability.	A 25 percent reduction in active grazing preference is contained in the AMP along with a five-pasture deferred rotation scheme. Pasture moves are based on desired utilization of key species.	Four key area trend transects were established in 1982. Utilization studies on these areas is conducted on an as-needed basis to "drive" the grazing system and evaluate the effectiveness of the AMP. An evaluation is scheduled for 1994.
00524--Cottonwood	A CRMP was signed in June 1987.	Improve range condition and forage production on upland sites, maintain shrub diversity for wildlife, and improve riparian habitat on Cottonwood Creek.	The CRMP established a June 15 turnout date and a two-pasture deferred rotation grazing system. A 50 percent reduction in grazing use as accepted for a five-year period ending in 1989. The grazing system was changed to a three-pasture deferred rotation in 1990.	An evaluation was conducted in 1990. Riparian trend appears up, while upland trend appears down. An evaluation is scheduled for 1994.

[1] Allotment 00604 is a large allotment with only a small portion being managed under the terms of the Fifteenmile Wild Horse Herd Management Area Plan. The remainder of the allotment is scheduled for AMP development.

TABLE 8 (Continued)

STATUS REPORT OF COMPLETED ALLOTMENT MANAGEMENT PLAN IMPLEMENTATION

ALLOTMENT NAME AND NUMBER	DECISION/AGREEMENT	GOALS	MANAGEMENT CHANGES	MONITORING/EVALUATION
02510--Gould Individual 00564--Little Buffalo Basin	An AMP was signed in August 1985.	The overall goal is to maintain or increase key plant species, maintain bank stability of Buffalo Creek, and maintain mosaic of sagebrush.	Allotment 02510 is managed under a three-pasture rest/rotation grazing system. Allotment 00564 is deferred in conjunction with 2510. The north pasture of 2510 is managed under a multi-pasture time control grazing system. The permittee is taking nonuse on 38 percent of the AUMs in allotment 0654 and 9 percent in allotment 02510 in an effort to make the AMP function as planned.	An evaluation in 1992 indicates that trend is upward in some, but not all areas. An evaluation is scheduled in 1996.
00639--Tatman Mountain Common 00640--Snyder	A Management Agreement was signed in December 1987 by one permittee.	Objectives relate to improvement in range condition.	One permittee accepted a 35 percent reduction in the initial stocking rate on the Tatman Common Allotment, and a 20 percent reduction on the Snyder Allotment. Turnout date is established as June 1.	Monitoring studies have not yet been established. Livestock use has not taken place in these two allotments for several years. Consequently, no action has taken place on development of the AMP.
00621--North Grass Creek 00616--Home	The 1973 AMP for these allotments is no longer applicable. A revision of the AMP is pending.	Pending.	Pending.	One trend transect in the North Grass Creek Allotment was established in 1982.

TABLE 8 (Continued)

STATUS REPORT OF COMPLETED ALLOTMENT MANAGEMENT PLAN IMPLEMENTATION

ALLOTMENT NAME AND NUMBER	DECISION/AGREEMENT	GOALS	MANAGEMENT CHANGES	MONITORING/EVALUATION
00622--South Highway 00623--North Highway	An AMP was signed in June 1986. This AMP appears to be functioning.	Improve range condition and forage production.	A three-pasture rotation system designed to allow grazing use during the critical growing season once in three years, has been established. The permittee agreed to a 32 percent reduction in voluntary non-use as an initial stocking rate.	Three trend transects were established in 1982. Utilization studies were conducted in the three pastures. An evaluation is scheduled for 1994.
00626--Timber Creek	The AMP was signed for this allotment in 1968.	Improve the quantity and quality of available forage for both livestock and wildlife, and to reduce soil erosion by increasing the basal vegetative cover.	This allotment has four pastures. One pasture is used early, one is deferred until mid-summer, and two receive total rest.	An evaluation in 1991 indicated that ecological condition and resource values has declined. In order to address these concerns the permittee took a 59 percent reduction in grazing preference and a change in the grazing rotation.
00509--New Burlington Group	An AMP was signed for this allotment in 1972.	The goal is to improve the quantity and quality of available forage for both livestock and wildlife, and to reduce soil erosion by increasing the basal vegetative cover.	Since the severe drought in 1977, the permittees have followed a double rest/rotation system which, combined with 60 percent nonuse, has arrested deterioration of the allotment. The quality of the informal grazing system exceed that of the formal plan.	Four trend transects were established in 1982 and utilization data is collected biannually. An evaluation in 1991 indicates a small upward trend. An evaluation is scheduled for 2003.

TABLE 8 (Continued)

STATUS REPORT OF COMPLETED ALLOTMENT MANAGEMENT PLAN IMPLEMENTATION

ALLOTMENT NAME AND NUMBER	DECISION/AGREEMENT	GOALS	MANAGEMENT CHANGES	MONITORING/EVALUATION
00510--Fernandez-Blu-Jay 02508--Fernandez-Blu-Jay	An AMP for these two allotments in aggregate was signed in 1972. A final decision was issued in 1993, reducing the grazing preference by 15 percent. Allotment 02508 and 00510 was combined and is now allotment 00510.	The goal for the allotment is to encourage a diverse plant community by improving the key plant species.	The BLM will continue to intensively monitor this allotment and pursue opportunities for management.	This allotment was formally evaluated in 1990. Analysis of the monitoring data indicates the trend is static to downward. An evaluation is scheduled for 2000.
00516--Blue Creek	An AMP was signed in 1984.	Improve range condition on upland sites, and riparian habitat.	A four-pasture rest/rotation grazing system is specified in the AMP. The permittees have accepted a 75 percent reduction in AUMs. Utilization by livestock of forage grass species is limited to 25 percent on elk winter range.	This allotment has had little livestock use since 1984. The allotment was evaluated in 1988. Major improvement in resource conditions, on both upland and riparian sites, have been documented. An evaluation is scheduled for 1997.
00637--Adam Weiss Peak (formally Grass Creek)	An AMP was signed in May 1985.	The long-term management goal is to improve range condition, forage production, and increase ground cover for watershed protection.	The allotment will be grazed two years during the critical growth period, two years with partial growing season use and one year on nongrowing season use.	Baseline data was collected in 1992. An evaluation in 1993 indicates improvement in the vigor of upland vegetation. An evaluation is scheduled for 1998.
00521--Cottonwood 00522--Grass Creek	An AMP was signed in August 1970.	The goals are to increase livestock forage and vegetative cover, maintain wildlife populations, and increase plant density to control erosion.	A five-pasture rest/rotation grazing system is prescribed in the AMP. The operator is utilizing only a small portion of the grazing preference allocated to these allotments.	Two trend transects were established in 00522 in 1982. This AMP will be evaluated and revised in 1995.

APPENDIX 3

TABLE 3-9
SCHEDULE FOR THE DEVELOPMENT OF NEW GRAZING ACTIVITY PLANS[1]

Allotment Name (Number)	Year of Scheduled Activity Plan Completion
New Burlington (00509)	1993
LU (00604)	1993
North Gooseberry (00508)	1994
Rattlesnake (00614), Lime Ridge (00615)	1994
Prospect Creek (00620), South Grass Creek (00678)	1994
Buffalo Creek (00579), Coal Mine (00580)	1994
Lower Cottonwood (00521), Grass Creek (00522), Highway Junction (00523)	1995
Wagonhound Bench (00573), Slab Creek (00575)	1995
Basin (00568), Curtis (00569), North Hart (00585), Three Peaks Anchor (00661), Spring Creek (00681)	1996
Lake Creek (00607), Vass (00608), Owl Creek (00609)	1996
South Fork North Fork (00560)	1996
Three Peaks (00541)	1996
Middle Creek (00519), Mountain (00672)	1997
Rooster Creek (00627), Hole in the Ground (00628), Renner Section 15 (02534)	1997
Hamilton Dome (00504), Richmond (00553), 21 Creek (00556), Buck Creek (00558)	1997
Enright (00662)	1998
Tatman Mountain Common (00636), Snyder (00640)	1998
Sand Springs (00526)	1998
North Grass Creek (00621)	1999
South Sleeper (00683)	1999
Padlock (00537)	1999
South Fork Elk Creek (00576), South Basin (00577), North Basin Group (00578)	2000
Six Mile (00528)	2000
South Gooseberry Group (00507)	2000
Elk Creek (00619)	2001
South Tatman (00612)	2001
Cottonwood Common (00503), Sand Draw (0090)	2001
YU Bench (01065)	2002
Whisky Gulch (00532), Home Ranch (00533)	2002

TABLE 3-9 (continued)
SCHEDULE FOR THE DEVELOPMENT OF NEW GRAZING ACTIVITY PLANS[1]

Allotment Name (Number)	Year of Scheduled Activity Plan Completion
Cannady Individual (00543)	2002
Highway (00546)	2003
D & LM Ind. (00548)	2003
South Owl Creek (00610)	2003
Meeteetse Draw (00566)	2004
Alamo Creek (00664)	2004
Shumway Individual (00648)	2004
Ayers Individual (00654)	2005
Individual (00539)	2005
Common Harvey (00506)	2005

[1]The allotments shown are all "I" category. Where allotments are grouped, they are likely to be combined in a single activity plan. The priority of activity plan development may vary as new issues and opportunities are identified. Current rates of activity plan development were used to make the projections.

TABLE 3-10
SCHEDULE FOR THE EVALUATION OF EXISTING GRAZING ACTIVITY PLANS[1]

Allotment Name (Number)	Year Scheduled for Evaluation of an Existing Activity Plan
Fernandez-Blu Jay (00510)	1993
Adam Weiss Peak (00637)	1993
Red Canyon (02539)	1993
South Highway (00622)	1994
Rock Creek (00525), Wagonhound (00596)	1994
Grass Point (00545)	1994
Lower Red Canyon (02505)	1995
Cottonwood Creek (00524)	1995
Fifteenmile Wild Horse Herd Management Area, LU (00604), Badger Basin (00652), Allen Basin (00669), Pitchfork (00676), Hunt Oil Fifteenmile (00686)	1995
Ten Mile (00671)	1996

TABLE 3-10 (continued)
SCHEDULE FOR THE EVALUATION OF EXISTING GRAZING ACTIVITY PLANS[1]

Allotment Name (Number)	Year Scheduled for Evaluation of an Existing Activity Plan
Gould Individual (02510)	1996
Upper Pastures (00633), Lower Pastures (00634)	1996
Prospect Common (00529), Spring Gulch (00531)	1997
Timber Creek (00626)	1997
Blue Creek (00516)	1997

[1]The allotments shown are all "I" category. Where allotments are grouped, they are likely to be combined in a single activity plan. The priority of activity plan evaluation may vary as new issues and opportunities are identified. Current rates of activity plan evaluation were used to make the projections.

TABLE 3-11
EXISTING RANGE PROJECTS ON PUBLIC LANDS BY ALLOTMENT

Allotment Number	Number of Reservoirs	Number of Developed Springs	Miles of Pipeline	Number of Prescribed Burns	Number of Wells	Other Projects
00063						1.9 Bighorn HMP/RAMP fence 7 potholes
00504	2					
00506						
00507	16	3	3.3		4	2 corrals 1 mile fence-water gap 1.8 miles fence-reservoir 1 guzzler 3 off-site waters 1 catchment
00508	39	1	5.5	29	3	8 miles fence ant eradication 13.8 miles fence-study plots 2 miles fence-riparian 3.8 miles fence-reservoirs 0.7 mile fence-seeps 1.1 miles fence-watershed 1 concrete stream crossing slab 1 corral 1 cattleguard 1,181 acres-contour furrow 52 acres-watershed treatment 1 diversion dike 3 guzzlers 4 off-site waters 1 seep

TABLE 3-11 (continued)
EXISTING RANGE PROJECTS ON PUBLIC LANDS BY ALLOTMENT

Allotment Number	Number of Reservoirs	Number of Developed Springs	Miles of Pipeline	Number of Prescribed Burns	Number of Wells	Other Projects
00509	61				1	0.4 mile fence-study plots 6.9 miles fence-reservoirs 2,115 acres contour furrow 7 cattleguards 1 corral 1 heron rookery 1.5 miles fence-holding pasture 1 gabion 1 detention dike 1 off-site water
00510	15					0.3 mile fence-reservoir
00512	4					0.7 mile fence-reservoir
00516				112		
00522	7		2		1	2 corrals
00523	5		2		3	1 water storage 1 corral 1 cattleguard
00524		1				0.4 mile fence-spring
00525						1.4 miles riparian exclosure
00526	4					
00527	4					
00529	2				1	
00530					1	
00531	2				1	
00534	1					1 cattleguard
00535		1				2
00536	1					
00538	3					1 cattleguard
00540	1					
00545	2				522	
00548	1					
00551	1					1 pond
00553						1
00554	1					1 cattleguard
00559	1					
00564			1		1	1 corral
00566	2	1				1 corral
00567	1					
00568			4.5			1 cattleguard
00569	1					2 cattleguards
00573	3	2				1 sheep shed 990 acres contour furrow
00574		1	1			1 cattleguard
00576	5					1 off-site water 0.3 mile fence-reservoir
00577	5					1 cattleguard

TABLE 3-11 (continued)
EXISTING RANGE PROJECTS ON PUBLIC LANDS BY ALLOTMENT

Allotment Number	Number of Reservoirs	Number of Developed Springs	Miles of Pipeline	Number of Prescribed Burns	Number of Wells	Other Projects
00578	6					0.6 mile fence-Bighorn river tracts 1 corral
00579	3	2				1 shed 1 cattleguard
00584	1					
00585	2					
00594	2	1				0.2 mile fence-study plot
00595	2	2				
00596	4					
00604	34		1.2		6	5 cattleguards 6 miles road 0.4 mile fence-study plots 3 sheds
00607	1					1 cattleguard
00608	3					
00609		2				1 off-site water
00612	1					
00613			0.2			
00614	1					
00616	2				3	
00618	1					
00619	7				1	1 pond
00620	2	3			1	
00621	2		1		2	
00622	3				2	5 acres ripping test
00623	5					1 mile road upgrade
00626	9					1 cattleguard 0.7 mile fence-reservoir 1,287 acres contour furrow
00627	1				1	
00628	1					
00629	1					0.3 mile fence-reservoir
00633		1		1,500		0.2 mile fence-spring 1 raintrap 1 storage tank
00634		4				1.2 miles fence-spring 750 acres contour furrow 1 bridge 1 treater water source
00637	1	1			1	
00638	1	1			1	
00639	12					
00640	10			670		0.3 mile fence-reservoir 1 off-site water
00643	1				1	
00644	4				1	1 cattleguard
00645					1	
00646	1					

TABLE 3-11 (continued)
EXISTING RANGE PROJECTS ON PUBLIC LANDS BY ALLOTMENT

Allotment Number	Number of Reservoirs	Number of Developed Springs	Miles of Pipeline	Number of Prescribed Burns	Number of Wells	Other Projects
00647	1				1	
00648	1					
00650	3					
00651	20				3	1.9 miles fence-reservoirs 1 off-site water
00652	12					1.2 miles fence-reservoirs 1,874 acres contour furrow 1 off-site water
00654		1				
00661	1					
00662	4					1 cattleguard 69 acres tree planting
00663	1					1 cattleguard
00665	4	3	1		4	0.8 mile fence-spring 1 storage tank
00668	2					2 ponds
00669	3					
00670	1					
00671	6				2	1 sheep shed 118 acres seeded
00674	1					1 corral
00676	4					
00678	4	1			2	
00682	4				2	
00683	1		1			1 reservoir repair 1 off-site water
02510	5			225		0.6 mile fence-reservoir 80 acres spray
02539	5		3.7	300		0.4 mile fence-seeps 1 mile road
02555	2					
TOTALS	**399**	**28**	**27.4**	**3,358**	**58**	

[1]In 1991 an analysis of 255 reservoirs in the Fifteenmile Creek watershed indicated that 16 percent of the reservoirs are reliable year-round, 32 percent provide water seasonably, and 52 percent are unreliable. Reservoirs elsewhere in the planning area would probably be in similar condition, proportionally.

APPENDIX 4

GAS AND OIL REASONABLY FORESEEABLE DEVELOPMENT

REASONABLY FORESEEABLE DEVELOPMENT SCENARIO FOR GAS AND OIL

Gas and Oil Play Descriptions

The United States Geological Survey (Fox and Dolton, 1989) has identified six gas and oil plays which occur within the boundaries of the planning area. (See Map 26 in Chapter 3.)

In the following discussion, these gas and oil plays are arranged in approximate order of exploration and development interest, from highest to lowest.

Basin-Margin Anticline Play

This play consists of anticlinal traps formed along the margins of the Bighorn Basin during the Laramide Orogeny, a mountain building episode from about 70 to 30 million years ago. The play has been extensively developed and twenty-five fields are in the planning area. Many formations, from Cambrian to Tertiary age, produce gas and oil with most fields having several productive zones.

Production depths vary from less than 100 feet to more than 12,000 feet. Estimated recoverable reserves for fields range from greater than 237 million barrels of oil at Hamilton Dome to 0.5 million barrels or less from smaller fields. Because the play has been extensively explored, the potential for significant new discoveries is low.

Deep-Basin Structure Play

A narrow band of fields occurs in the northeastern corner of the planning area along an anticline known as the Fivemile Trend. Gas and oil occur in Cretaceous age sedimentary rocks that were once deltaic channels and sandbars, shallow marine sediments, and river channel sands. Production, which is primarily gas, comes from depths of 11,000 feet at the southeast end of the play to 25,000 feet at the northwest. The extent of this play is limited in the planning area and the potential for new discoveries is low to moderate; however, development would continue in existing, recently-discovered fields within the play.

Basin-Center Gas Play

The potential for significant, deep gas accumulations exists in the center of the Bighorn Basin. Several formations are known to possess the necessary permeability and porosity at depth in the planning area. Many of these formations occur with hydrocarbon source rocks and have the potential to form "pinchout" traps. Four deep gas fields have been discovered in the planning area; two were marginally economic and have been abandoned, and two are currently producing with combined reserves of approximately 5 billion cubic feet. Overall, this play is relatively unexplored. The potential for significant discoveries is good, but exploration interest is expected to remain low during the analysis period because of the depressed state of the gas market.

Sub-Absaroka Play

The western margin of the Bighorn Basin is covered by volcanic rocks known as the "Absaroka Supergroup." This cover obscures the geology of the underlying rocks. It is postulated that anticlinal and fault-related traps, like those of the adjacent Basin-Margin Anticline Play exist under these volcanics, representing an extension of that play. Three small anticlinal fields have been discovered on the eastern fringe of the Sub-Absaroka Play, although the play has not been extensively tested. Recent exploration to extend the play to the west has been unsuccessful. The potential for future discoveries is uncertain, but the play should continue to attract a low to moderate level of exploratory (wildcat well) drilling.

Phosphoria Play

Stratigraphic traps occur in the Phosphoria Formation where rocks undergo changes in depositional environments from west to east. An excellent example of a field in the Phosphoria Play is Cottonwood Creek, just east of the planning area. Only a small portion of this play extends into the planning area, but new discoveries could cause limited development to occur.

Basin-Margin Subthrust Play

In this play, gas and oil is trapped beneath large thrust faults that border the structural margins of the Bighorn Basin. Production depths generally range from 10,000

to 20,000 feet. The extent of this play is subject to interpretation and is inferred from the existence of known thrust faults and structural trends. No serious exploration has occurred in this play within the planning area. Consequently, the potential for future discoveries in this play are rated as low.

Gas and Oil Potential

Map 25 in Chapter 3 shows gas and oil fields and generalized gas and oil resource potential for the planning area. The evaluation of resource potential on Map 25 takes into account existing fields and estimates of current exploration interest, for the play boundaries described above.

Summary of Historical and Current Activity

Tables 4-1 through 4-5 and Figures 4-1 through 4-8 at the end of this appendix show current, historic, and projected gas and oil exploration and development activity in the planning area, under all alternatives.

Development has continued uninterrupted in the planning area since 1914 when the Grass Creek and Little Buffalo Basin Oil Fields were discovered. As of 1990 there were 26 active, 4 shut-in, and 7 abandoned fields. Associated with these fields were about 1,200 active wells of which 42 produced gas and 788 produced oil. The cumulative 1990 production from these active fields, as reported to the Wyoming Oil and Gas Conservation Commission, was approximately 7.6 billion cubic feet (BCF) of gas and 7.6 million barrels (MMB) of oil from private, state, and federal lands. Of this total, 6.4 BCF of gas and 5.5 MMB of oil came from the BLM-administered mineral estate.

The Wyoming Oil and Gas Conservation Commission yearbook data shows the general trends in the number of active wells and in production levels for the years 1971 through 1991. These data show that the number of producing gas and oil wells in the planning area increased until 1985 when, in response to the general decline in industry activity, the number of wells began to fall modestly. Overall these data show an increase in the number of producing wells of about 1.74 percent per year.

During this same period, oil production has declined in the planning area except for a small increase during 1975 and 1976 related to the Middle East oil embargo. Data from 1971 through 1991 shows a decline in production of 2.74 percent per year. This decline rate compares closely with the Wyoming statewide decline rate estimate of 1.57 percent per year over the same period.

Trends in gas production are less clear, with an initial decline during 1971 through 1977 and a general, though highly variable, production increase subsequently. Curve fits of the data demonstrate an overall increase of 0.16 percent during 1971 through 1991. An estimate for the years 1977 through 1991 (based on a clear break in the graphed data) gives an increase in production of about 5.87 percent per year. This latter figure compares closely with the statewide production increase of about 5.78 percent per year using 74 years of data from 1918 through 1991.

Development and exploration drilling during 1965 through 1992 experienced an overall slow decline on BLM-administered lands, based on Worland District Individual Well Records. During part of this period, development drilling increased from 1965 through the boom years of the early 1980s but, beginning in 1982, drilling showed a sharp decline reflecting the "bust" experienced generally in the gas and oil industry. An estimate of trends, based on curve fitting of all the data (1965-1992), or on only "non-boom" year data (1965-1974 and 1985-1992), gives similar results of approximately 1.20 percent to 2.07 percent per year decline respectively. Exploration drilling over the same period, although variable, showed no apparent trend during 1965 through 1984. Beginning in 1985, exploration drilling declined sharply, again reflecting the industry "bust". The overall trend for exploration drilling from 1965 through 1992 decreased at a rate of approximately 2.54 percent per year. Factoring out the boom years, the trend decreased at a rate of approximately 3.83 percent per year.

The proportion of wells drilled for BLM-administered minerals, compared with state and privately-owned minerals, shows an interesting history. During 1965 through 1977, about 83 percent of the development and wildcat wells in the planning area were on BLM-administered minerals. In 1987, drilling on BLM-administered minerals dropped to approximately 55 percent of the total drilling in the planning area, and has remained at that level. The cause of this change is unclear, but the percentage of drilling on BLM-administered mineral estate is anticipated to remain at 55 percent of the planning area total.

Wildcat wells have been drilled in 4 of the 6 previously described (Fox and Dolton, 1989) exploration plays within the planning area since 1965 with varying degrees of success. About half of the wildcat wells have been drilled in the prolific basin margin anticlinal play with a success rate of 1 in 15. The Deep-Basin Structure play, with 2 successful wildcats out of 14 total, showed the greatest success ratio of 1 in 7. Based on drilling reports and planning information, no Phosphoria or Basin-Margin Subthrust plays are interpreted as having been drilled during 1965 through 1992.

TABLE 4-1
GRASS CREEK PLANNING AREA OIL AND GAS FIELD STATUS AND PRODUCTION FOR CALENDAR YEAR 1990[1]

Field Name	County(ies)	Year Discovered	Location (Township & Range	Number of Producing Wells	Oil Production Dec 1990	Total Oil Production 1990	Cumulative Oil Production to 1991	Gas Production Dec 1990	Total Gas Production 1990	Cumulative Gas Production to 1991	Remarks
Adam	Hot Springs	1980	45 N., 99 W.	1	351	4,599	73,435	0	0	0	
Aspen Creek	Hot Springs	1974	45 N., 101 W.	0	0	0	332,334	0	0	0	Shut-in
Baird Peak	Hot Springs	1964	45 N. 100 W.	1	222	2,192	1,581,741	0	0	0	
Boulder Gulch	Hot Springs	1981	45 N., 96 W.	3	260	3,334	57,320	240	3,415	134,899	
Buffalo Rim	Hot Springs	1978	47 N., 99 W.	0	0	0	3,373	0	0	0	Abandoned
Dickie	Hot Springs	1953	45 N., 101 W.	0	0	0	100,945	0	0	0	Shut-in
Dobie Creek	Big Horn	1978	49 N., 94 W.	4	486	6,374	249,822	25,936	220,690	11,997,024	
Enos Creek	Hot Springs	1923	46 N., 100 W.	3	458	4,620	846,964	320	5,150	433,828	
Fairview	Big Horn	1977	52 N., 94 W.	2	210	1,495	20,286	2,398	37,205	601,434	
Five Mile	Big Horn	1952	49 N., 93 W.	13	9,583	142,746	784,375	259,881	3,114,707	17,104,961	
Fourteenmile	Washakie	1952	46 N., 94 W.	0	0	0	131,095	0	0	696,923	Abandoned
Fritz	Big Horn	1981	50 N., 95 W.	2	281	4,890	39,265	6,918	66,059	152,163	
Gebo	Hot Springs	1943	44 N., 95 W.	41	31,871	413,088	29,442,163	382	4,957	926,177	
Golden Eagle	Hot Springs	1921	45 N., 97 W.	10	5,241	71,062	13,691,314	2,374	35,338	2,810,138	
Gooseberry	Park	1937	46 & 47 N., 100 W.	10	12,819	165,006	7,439,269	801	11,541	66,720	
Grass Creek	Hot Springs	1914	46 N., 98 W.	257	174,059	2,126,256	189,341,119	153,160	153,160	7,567,146	
Grass Creek South	Hot Springs	1980	45 N., 98 W.	0	0	0	6,823	0	0	0	Abandoned

1 Source: *1990 Wyoming Oil and Gas Fields* from WY O&GCC 1991 Statistics Book

TABLE 4-1
GRASS CREEK PLANNING AREA OIL AND GAS FIELD STATUS AND PRODUCTION FOR CALENDAR YEAR 1990[1]

Field Name	County(ies)	Year Discovered	Location (Township & Range	Number of Producing Wells	Oil Production Dec 1990	Total Oil Production 1990	Cumulative Oil Production to 1991	Gas Production Dec 1990	Total Gas Production 1990	Cumulative Gas Production to 1991	Remarks
Greybull	Big Horn	1907	52 N., 93 W.	0	0	0	110,530	0	0	20	Percent production estimation = [7[2] Wells (1993)]/[66 Field Total(1993)] (based on 1:24000 maps) Shut-in 1990
Greybull West	Big Horn	1952	52 N., 94 W.	0	0	0	33,605	0	0	1,694,525	Abandoned
Hamilton Dome	Hot Springs	1918	44 N., 97 & 98 W.	243	197,397	2,321,103	235,033,638	0	0	108,121	
Hand Creek	Hot Springs	1983	46 N., 100 W.	2	586	7,297	85,247	0	0	0	
King Dome	Hot Springs	1964	44 N., 96 W.	1	2,042	7,836	289,101	0	0	170	
Little Buffalo Basin	Park-Hot Springs	1914	47 N., 99 W.; 48 N., 100 W.	169	124,518	1,976,872	122,808,258	58,338	714,527	120,039,447	
Little Grass Creek	Hot Springs	1917	46 N., 99 W.	3	26	135	1,385	26,669	195,130	9,492,596	
Little Sand Draw	Hot Springs	1949	44 N., 96 W.	23	17,166	186,166	10,855,795	1,901	22,824	202,222	
Meeteetse	Park	1954	49 N., 99 W.	14	693	10,092	374,928	144,202	2,183,449	23,241,581	
Prospect Creek	Hot Springs	1963	45 N., 100 W.	0	0	0	272,927	0	0	338	Shut-in
Pulliam	Washakie	1982	46 N., 94 W.	0	0	0	1,605	0	0	0	Abandoned
Seller Draw	Park	1978	48 N., 98 W.	1	0	0	0	0	15,710	3,135,359	

1 Source: *1990 Wyoming Oil and Gas Fields* from WY O&GCC 1991 Statistics Book
2 Grass Creek Planning Area Wells

TABLE 4-1
GRASS CREEK PLANNING AREA OIL AND GAS FIELD STATUS AND PRODUCTION FOR CALENDAR YEAR 1990[1]

Field Name	County(ies)	Year Discovered	Location (Township & Range	Number of Producing Wells	Oil Production Dec 1990	Total Oil Production 1990	Cumulative Oil Production to 1991	Gas Production Dec 1990	Total Gas Production 1990	Cumulative Gas Production to 1991	Remarks
Skelton Dome	Hot Springs	1954	45 N., 99 W.	0	0	0	0	0	0	55,881	Abandoned
Sunshine North	Park	1928	47 N., 101 W.	14	5,824	77,893	2,067,572	0	0	0	Percent Production Estimation = [18[2] Wells (1993)]/[22 Field Total(1993)] (based on 1:24000 maps)
Sunshine South	Park	1926	46 N., 101 W.	0	0	0	380,428	0	0	0	Abandoned
Wagonhound	Hot Springs	1944	44 N., 98 W.	4	705	8,460	633,546	0	0	9,612	
Walker Dome	Hot Springs	1930	46 N., 99 W.	8	7,637	84,078	3,306,671	1,301	11,068	840,337	
Waugh	Hot Springs	1934	44 N., 96 & 97 W.	4	672	9,263	912,685	0	0	168,779	
Worland	Washakie	1946	48 N., 92 W.	6	976	13,049	5,324,792	71,307	785,741	115,411,960	Percent Production Estimation on = [11[2] Wells (1993)]/[38 Field Total(1993)] (based on 1:24000 maps)
Totals Grass Creek Planning Area				839	594,082	7,647,907	626,634,355	756,128	7,580,671	316,892,361	

1 Source: *1990 Wyoming Oil and Gas Fields* from WY O&GCC 1991 Statistics Book
2 Grass Creek Planning Area Wells

TABLE 4-2 Grass Creek Planning Area Active Well Status				
Well Status	**No. Wells on BLM-Administered Mineral Estate**	**No. Wells on State or Private Land**	**Total Wells in Planning Area**	**Percentage on BLM-Administered Mineral Estate**
Producing Oil Wells	510	200	710	72%
Producing Gas Wells	36	7	43	84%
Shut-in Oil Wells	18	21	39	46%
Shut-in Gas Wells	15	3	18	83%
Total Oil & Gas Wells	579	231	810	71%
Water Supply Wells	4	2	6	67%
Water Disposal Wells	2	0	2	100%
Water Injection Wells	213	112	325	66%
Shut-in Water Injection Wells	45	4	49	92%
Total Water Wells	264	118	382	69%
Total Active Wells	843	349	1,192	71%

1 Source: Well Status Files (last update 9/2/93)

TABLE 4-3
GRASS CREEK PLANNING AREA ANNUAL OIL & GAS PRODUCTION
[Annual Gas and Oil Field Production and Active Well Count and the Least Squares Exponential Decline Curve Production Estimates]

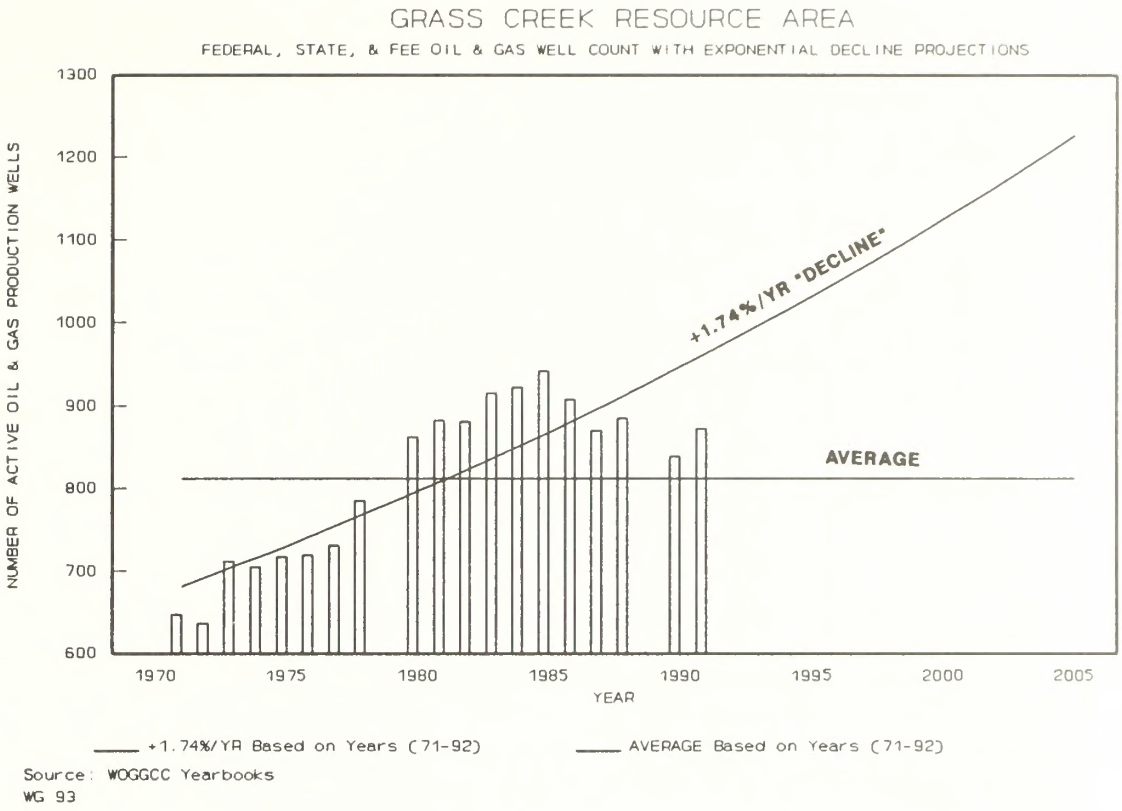
Year	Actual Number of Wells	Well Count Estimate Function (Yrs 71-92) +1.74%/Yr Decline	Estimate Function (Yrs 71-92) Average	Oil--Actual Production (BBLs)	Production Estimate Function (Yrs 71-92) -2.74%/Yr Decline	Estimate Function (Yrs 77-92) -5.29%/Yr Decline	Gas--Actual Production (MCF)	Production Estimate Function (Yrs 71-92) +0.16%/Yr Decline	Estimate Function (Yrs 77-92) +5.87%/Yr Decline
1971	648	682	812	13,097,056	15,353,678		9,595,354	5,557,409	
1972	637	694	812	12,254,234	14,933,367		10,484,561	5,566,200	
1973	712	706	812	11,723,749	14,524,563		9,039,838	5,575,004	
1974	705	718	812	11,681,850	14,126,949		5,275,002	5,583,823	
1975	717	731	812	14,575,256	13,740,221		4,225,699	5,592,655	
1976	720	744	812	17,255,230	13,364,079		3,323,641	5,601,502	
1977	731	756	812	15,227,506	12,998,234	16,206,986	2,722,151	5,610,362	3,578,075
1978	885	770	812	15,818,042	12,642,404	15,349,344	3,352,779	5,619,236	3,787,973
1979		783	812		12,296,315	14,537,088		5,628,125	4,010,184
1980	863	797	812	13,551,151	11,959,701	13,767,815	5,474,783	5,637,027	4,245,431
1981	883	811	812	13,232,253	11,632,301	13,039,250	5,547,557	5,645,944	4,494,477
1982	881	825	812	12,164,942	11,313,864	12,349,239	4,522,032	5,654,874	4,758,133
1983	915	839	812	11,783,827	11,004,144	11,695,742	3,738,900	5,663,819	5,037,256
1984	922	854	812	11,170,718	10,702,903	11,076,827	6,423,900	5,672,778	5,332,753
1985	941	868	812	10,884,878	10,409,909	10,490,663	8,926,428	5,681,751	5,645,584
1986	908	884	812	10,284,012	10,124,935	9,935,518	5,597,878	5,690,739	5,976,767
1987	870	899	812	9,536,860	9,847,762	9,409,751	6,487,027	5,699,740	6,327,378
1988	885	915	812	9,249,884	9,578,178	8,911,806	5,753,201	5,708,756	6,698,556
1989		930	812		9,315,973	8,440,211		5,717,786	7,091,508
ESTIMATE FUNCTION PROJECTIONS									
1990	839	947	812	7,647,907	9,060,946	7,993,572	7,580,671	5,726,830	7,507,512
1991	872	963	812	7,158,799	8,812,900	7,570,568	6,782,790	5,735,889	7,947,920

TABLE 4-3
GRASS CREEK PLANNING AREA ANNUAL OIL & GAS PRODUCTION
[Annual Gas and Oil Field Production and Active Well Count and the Least Squares Exponential Decline Curve Production Estimates]

Year	Actual Number of Wells	Well Count Estimate Function (Yrs 71-92) +1.74%/Yr Decline	Estimate Function (Yrs 71-92) Average	Oil--Actual Production (BBLs)	Production Estimate Function (Yrs 71-92) -2.74%/Yr Decline	Estimate Function (Yrs 77-92) -5.29%/Yr Decline	Gas--Actual Production (MCF)	Production Estimate Function (Yrs 71-92) +0.16%/Yr Decline	Estimate Function (Yrs 77-92) +5.87%/Yr Decline
ESTIMATE FUNCTION PROJECTIONS (Continued)									
1992		980	812		8,571,645	7,169,949		5,744,962	8,414,163
1993		997	812		8,336,994	6,790,530		5,754,049	8,907,756
1994		1,014	812		8,108,767	6,431,188		5,763,151	9,430,305
1995		1,032	812		7,886,787	6,090,863		5,772,267	9,983,508
1996		1,050	812		7,670,885	5,768,547		5,781,397	10,569,164
1997		1,068	812		7,460,892	5,463,287		5,790,542	11,189,175
1998		1,087	812		7,256,649	5,174,181		5,799,702	11,845,557
1999		1,106	812		7,057,996	4,900,373		5,808,876	12,540,444
2000		1,125	812		6,864,782	4,641,055		5,818,064	13,276,095
2001		1,144	812		6,676,857	4,395,460		5,827,267	14,054,900
2002		1,164	812		6,494,076	4,162,861		5,836,484	14,879,392
2003		1,185	812		6,316,299	3,942,571		5,845,717	15,752,251
2004		1,205	812		6,143,389	3,733,938		5,854,963	16,676,314
2005		1,226	812		5,975,212	3,536,346		5,864,225	17,654,584
Totals for the Years 1990-2005		17,293	12,995		118,695,077	87,765,289		92,724,385	190,629,040
Average for the Years 1990-2005		1,081	812		7,418,442	5,485,331		5,795,274	11,914,315

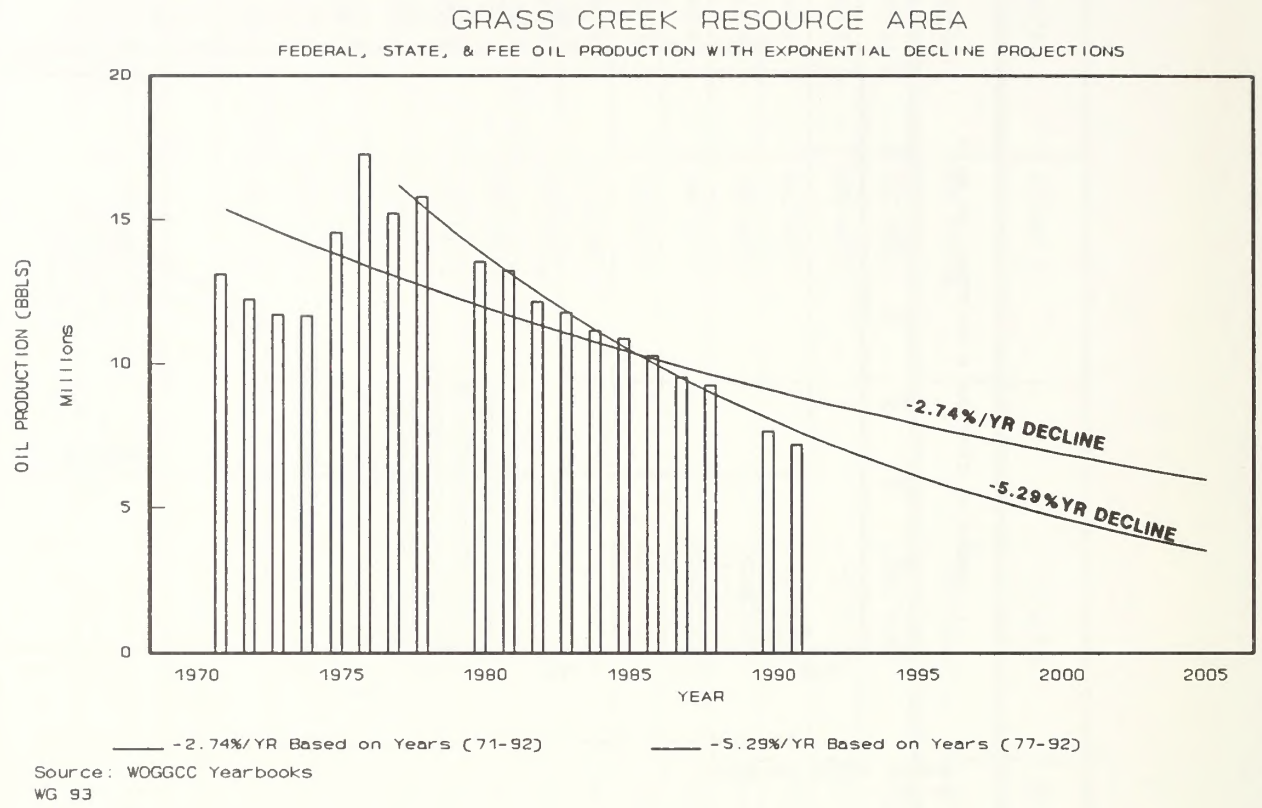
1 Source: Wyoming Oil & Gas Conservation Commission Yearbooks

FIGURE 4-1



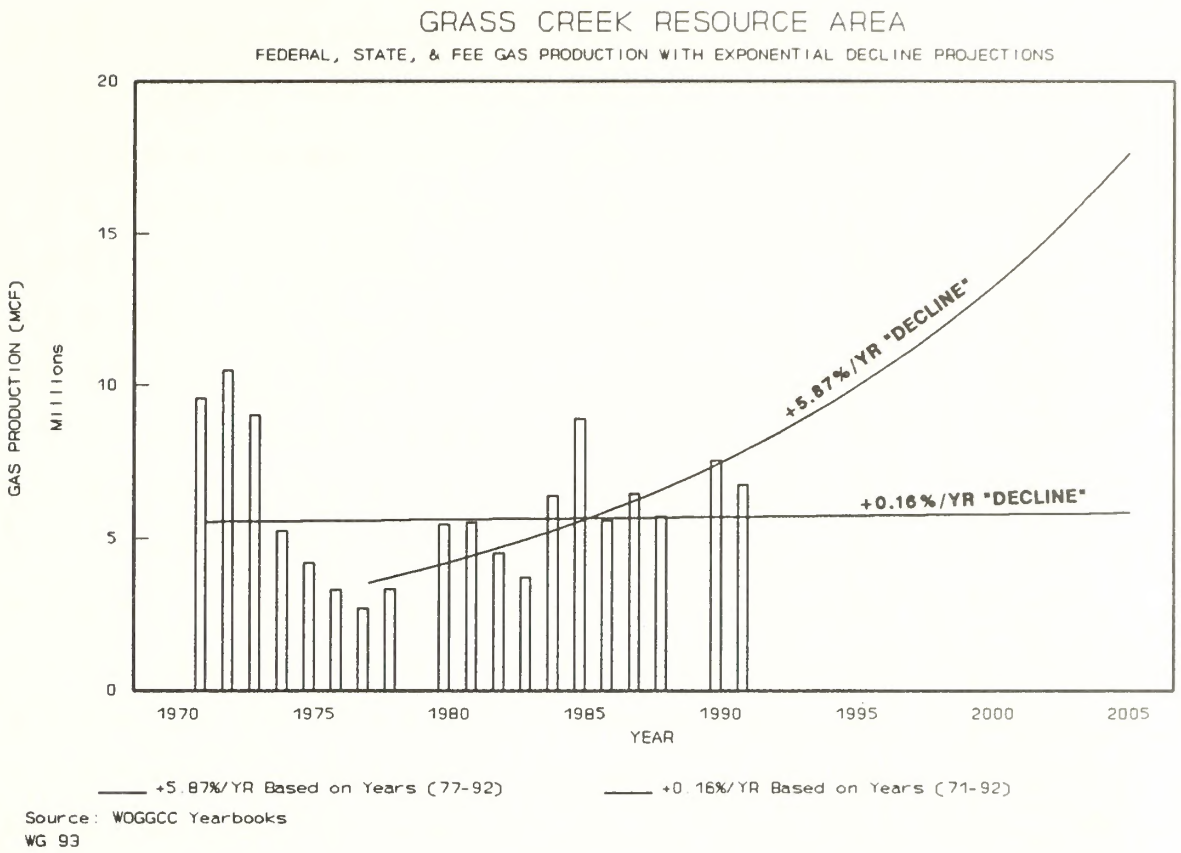
Active oil and gas production wells in the Grass Creek planning area and the average and least squares exponential decline curve fit with projection.

FIGURE 4-2



Oil production in the Grass Creek planning area and the least squares exponential decline curve fits over specified years. Expected decline is approximately minus 3 percent (-2.74 percent) per year.

FIGURE 4-3



Gas production in the Grass Creek planning area and the least squares exponential decline curve fits over specified years. Expected decline is approximately plus 6 percent (+5.87 percent) per year.

TABLE 4-4

GRASS CREEK PLANNING AREA DRILLING ACTIVITY 1965-1992

(Percentages have been rounded to nearest tenth of one percent)

DEVELOPMENT																															Total	Yearly Average
Year	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992		
On BLM-Administered Mineral Estate																																
Oil	7	9	9	13	8	21	16	21	24	17	19	12	43	27	33	36	18	26	42	22	17	3	9	8	3	2	2	3	470	16.8
Gas	0	0	0	0	0	0	0	0	0	0	2	0	0	3	4	6	4	3	0	2	1	1	0	0	4	2	0	0	32	1.1
Dry	4	2	3	0	2	1	1	2	2	0	2	1	2	2	2	12	8	2	2	3	3	3	1	1	3	2	0	0	66	2.4
WIW[1]	0	0	0	1	0	1	3	1	0	1	7	0	0	0	5	4	2	10	10	4	4	0	2	0	2	1	0	0	58	2.1
GIW[2]	0	1	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0.1
Total	**11**	**12**	**12**	**15**	**10**	**23**	**21**	**25**	**26**	**18**	**30**	**13**	**45**	**32**	**44**	**58**	**32**	**41**	**54**	**31**	**25**	**7**	**12**	**9**	**12**	**7**	**2**	**3**	**630**	**22.5**
On State Lands																														
Oil	0	1	0	0	0	1	1	0	1	0	0	0	4	0	0	1	0	0	0	0	1	0	0	1	0	0	0	1	12	0.4
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	0.1
Dry	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	4	0.1
WIW[1]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0.04
GIW[2]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Total	**0**	**1**	**1**	**0**	**0**	**1**	**1**	**1**	**1**	**0**	**0**	**0**	**4**	**1**	**0**	**1**	**3**	**0**	**0**	**0**	**2**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**19**	**0.7**
On Private Lands																														
Oil	3	4	0	0	2	4	1	1	2	2	2	3	4	6	6	3	9	3	3	3	3	0	11	1	2	5	4	2	89	3.2
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Dry	0	0	0	1	1	1	0	0	1	0	1	0	0	0	1	0	1	0	2	1	0	0	0	0	0	0	0	1	11	0.4
WIW[1]	0	1	0	0	0	0	2	0	0	0	2	0	1	0	1	1	0	1	0	1	0	0	4	4	0	2	0	0	20	0.7
GIW[2]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Total	**3**	**5**	**0**	**1**	**3**	**5**	**3**	**1**	**3**	**2**	**5**	**3**	**5**	**6**	**8**	**4**	**10**	**4**	**5**	**5**	**3**	**0**	**15**	**5**	**2**	**7**	**4**	**3**	**120**	**4.3**
DEVELOPMENT WELLS																														
Total	**14**	**18**	**13**	**16**	**13**	**29**	**25**	**27**	**30**	**20**	**35**	**16**	**54**	**39**	**52**	**63**	**45**	**45**	**59**	**36**	**30**	**7**	**27**	**15**	**14**	**14**	**6**	**7**	**769**	**27.5**

1 WIW = Water Injection Well

2 GIW = Gas Injection Well

TABLE 4-4
GRASS CREEK PLANNING AREA DRILLING ACTIVITY 1965-1992 (Continued)

(Percentages have been rounded to nearest tenth of one percent)

WILDCAT WELLS

Year	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	Total	Yearly Average
On BLM-Administered Mineral Estate																														
Oil	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0	2	0	0	1	0	0	0	0	0	0	0	0	0	6	0.2
Gas	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	3	0.1
Dry	3	4	8	6	1	2	4	1	3	6	2	3	0	8	5	5	6	5	5	7	2	0	0	0	3	2	2	0	93	3.3
Total	**3**	**4**	**8**	**6**	**1**	**2**	**4**	**2**	**4**	**6**	**2**	**3**	**1**	**10**	**5**	**8**	**6**	**5**	**6**	**7**	**2**	**0**	**0**	**0**	**3**	**2**	**2**	**0**	**102**	**3.6**
On State Lands																														
Oil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Gas	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0.1
Dry	0	0	1	0	1	0	0	1	0	0	0	0	0	0	1	0	1	2	2	2	0	0	0	0	0	0	1	3	15	0.5
Total	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**2**	**2**	**2**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**3**	**17**	**0.6**
On Private Lands																														
Oil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Dry	0	0	1	2	3	4	1	0	1	2	3	2	2	0	2	1	2	0	1	2	0	0	0	1	0	0	0	0	30	1.1
Total	**0**	**0**	**1**	**2**	**3**	**4**	**1**	**0**	**1**	**2**	**3**	**2**	**2**	**0**	**2**	**1**	**2**	**0**	**1**	**2**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**30**	**1.1**
WILDCAT WELLS																														
Total	**3**	**4**	**10**	**8**	**5**	**6**	**5**	**3**	**5**	**8**	**5**	**6**	**3**	**10**	**8**	**9**	**10**	**7**	**9**	**11**	**2**	**0**	**0**	**1**	**3**	**2**	**3**	**3**	**149**	**5.3**

TOTAL WILDCAT & DEVELOPMENT WELLS

	17	22	23	24	18	35	30	30	35	28	40	22	57	49	60	72	55	52	68	47	32	7	27	16	17	16	9	10	918	32.8
Percentage of Total that are on BLM-Administered Mineral Estate																														
	82.4	72.7	87.0	87.5	61.1	71.4	83.3	90	85.7	85.7	80.0	72.7	80.7	85.7	81.7	91.7	69.1	88.5	88.2	80.9	84.4	100.0	44.4	56.3	88.2	56.3	44.4	30.0		79.7
Percentage of Total that are on State Lands																														
	0.0	4.6	8.7	0.0	5.6	2.9	3.3	6.7	2.9	0.0	0.0	4.6	7.0	2.0	1.7	1.4	9.1	3.9	2.9	4.3	6.3	0.0	0.0	6.3	0.0	0.0	11.1	40.0		3.9
Percentage of Total that are on Private Lands																														
	17.6	22.7	4.4	12.5	33.3	25.7	13.3	3.3	11.4	14.3	20.0	22.7	12.3	12.2	16.7	6.9	21.8	7.7	8.8	14.9	9.4	0.0	55.6	37.5	11.8	43.8	44.4	30.0		16.3
Percentage of Total that are Wildcat Wells																														
	17.6	18.2	43.5	33.3	27.8	17.1	16.7	10.0	14.3	28.6	12.5	27.3	5.3	20.4	13.3	12.5	18.2	13.5	13.2	23.4	6.3	0.0	0.0	6.3	17.6	12.5	33.3	30.0		16.2
Percentage of Wildcats that are Successful																														
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.3	20.0	0.0	0.0	16.7	33.3	20.0	0.0	33.3	10.0	0.0	11.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		7.4

TABLE 4-4

GRASS CREEK PLANNING AREA DRILLING ACTIVITY 1965-1992 (Continued)

(Percentages have been rounded to nearest tenth of one percent)

PROJECTIONS

DEVELOPMENT WELLS

Year	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Total	14	18	13	16	13	29	25	27	30	20	35	16	54	39	52	63	45	45	59	36	30	7	27	15	14
1.20% Per Year Decline (65-92)	26.7	26.4	26.1	25.8	25.5	25.2	24.9	24.6	24.3	24.0	23.7	23.4	23.1	22.8	22.6	22.3	22.0	21.8	21.5	21.2	21.0	20.7	20.5	20.2	20.0
2.07% Per Year Decline (65-74,85-92)	21.2	20.7	20.3	19.9	19.5	19.1	18.7	18.3	17.9	17.5	17.2	16.8	16.5	16.1	15.8	15.5	15.2	14.8	14.5	14.2	13.9	13.7	13.4	13.1	12.8

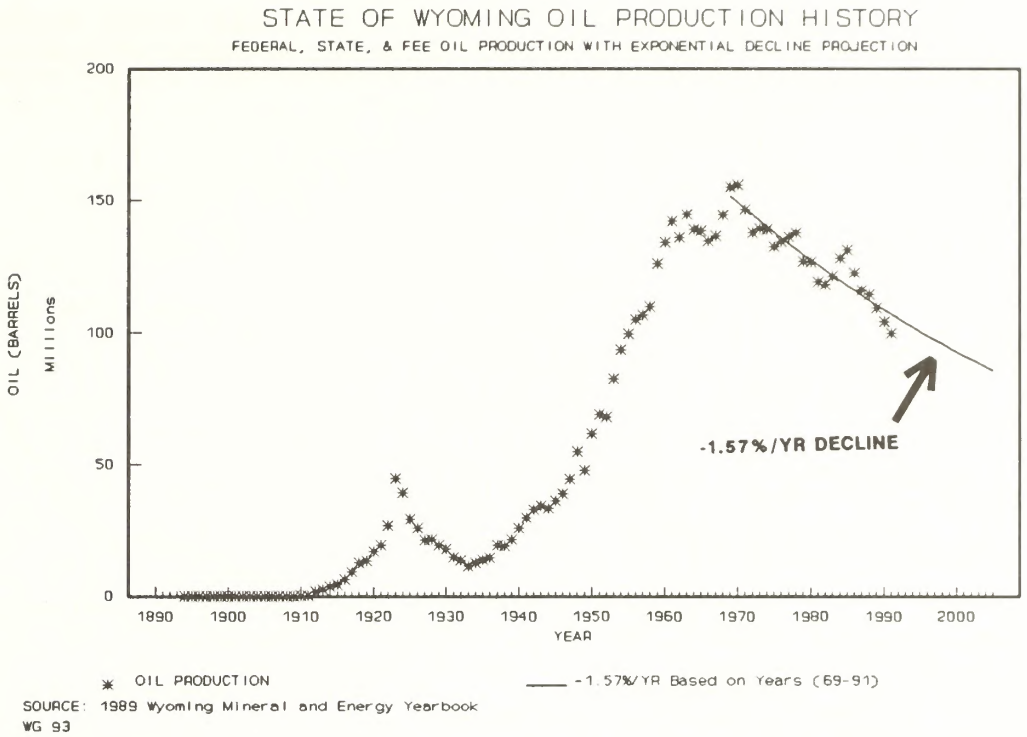
Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	1990 to 2005 Sum	1990 to 2005 Average
Total	14	6	7	0	0	0	0	0	0	0	0	0	0	0	0	0		
1.20% Per Year Decline (65-92)	19.8	19.5	19.3	19.1	18.8	18.6	18.4	18.2	17.9	17.7	17.5	17.3	17.1	16.9	16.7	16.5	289	18.1
2.07% Per Year Decline (65-74,85-92)	12.6	12.3	12.0	11.8	11.6	11.3	11.1	10.8	10.6	10.4	10.2	10.0	9.8	9.6	9.4	9.2	173	10.8

WILDCAT WELLS

Year	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Total	3	4	10	8	5	6	5	3	5	8	5	6	3	10	8	9	10	7	9	11	2	0	0	1	3
2.54% Per Year Decline (65-92)	6.8	6.6	6.5	6.3	6.1	6.0	5.8	5.7	5.5	5.4	5.3	5.1	5.0	4.9	4.8	4.6	4.5	4.4	4.3	4.2	4.1	4.0	3.9	3.8	3.7
3.83% Per Year Decline (65-74,85-92)	6.0	5.8	5.6	5.4	5.2	5.0	4.8	4.6	4.4	4.3	4.1	3.9	3.8	3.6	3.5	3.4	3.2	3.1	3.0	2.9	2.8	2.7	2.6	2.5	2.4

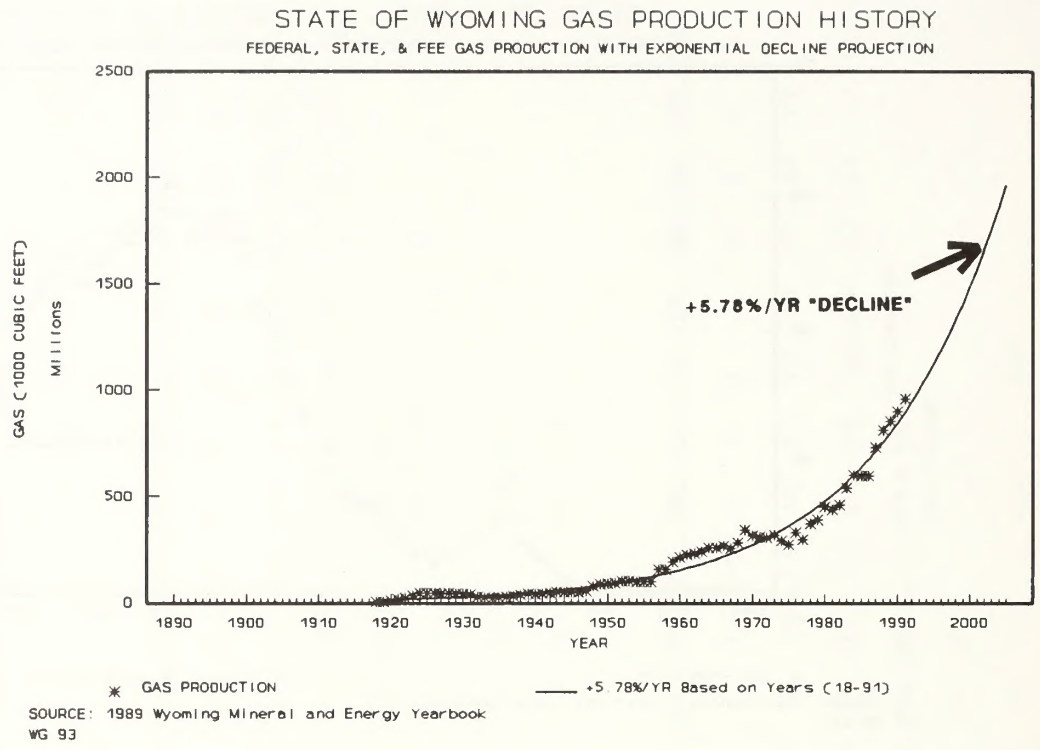
Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	1990 to 2005 Sum	1990 to 2005 Average
Total	2	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0		
2.54% Per Year Decline (65-92)	3.6	3.5	3.4	3.3	3.2	3.2	3.1	3.0	2.9	2.8	2.8	2.7	2.6	2.6	2.5	2.4	47.6	2.98
3.83% Per Year Decline (65-74,85-92)	2.3	2.2	2.1	2.0	2.0	1.9	1.8	1.7	1.7	1.6	1.54	1.48	1.42	1.37	1.31	1.26	27.6	1.72

FIGURE 4-4



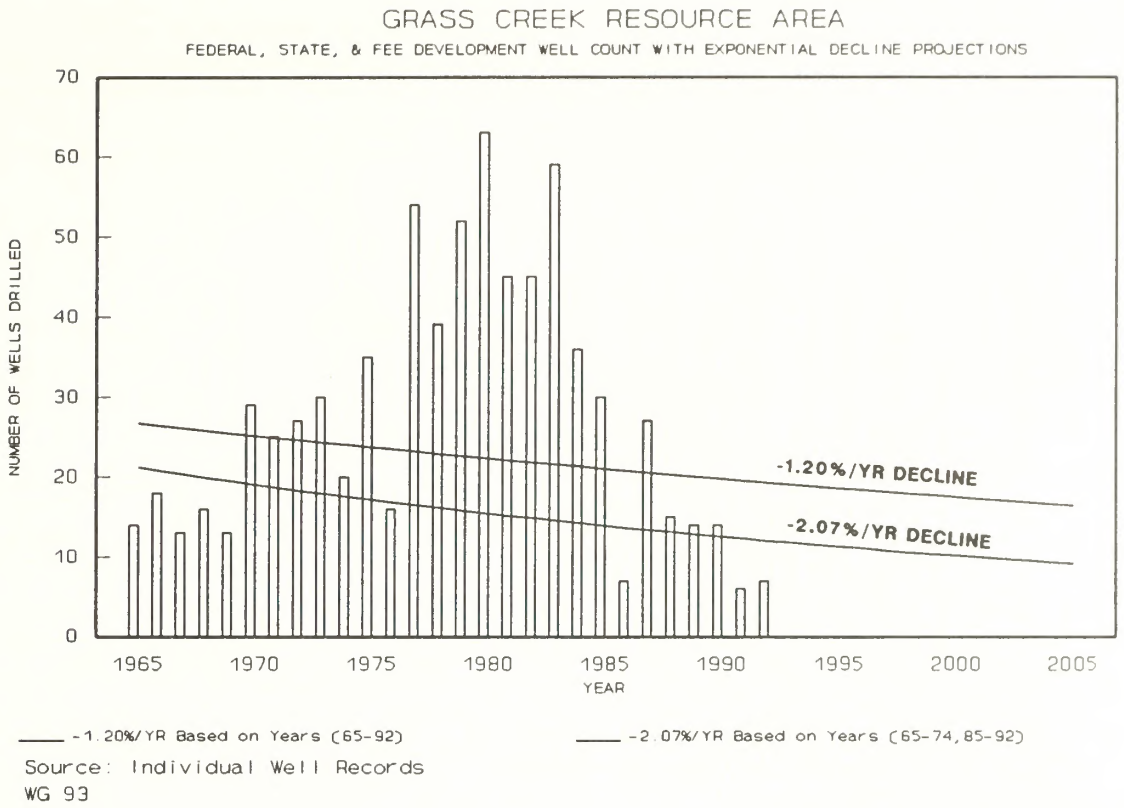
Historic oil production for the state of Wyoming with least squares exponential decline curve fit and projection.

FIGURE 4-5



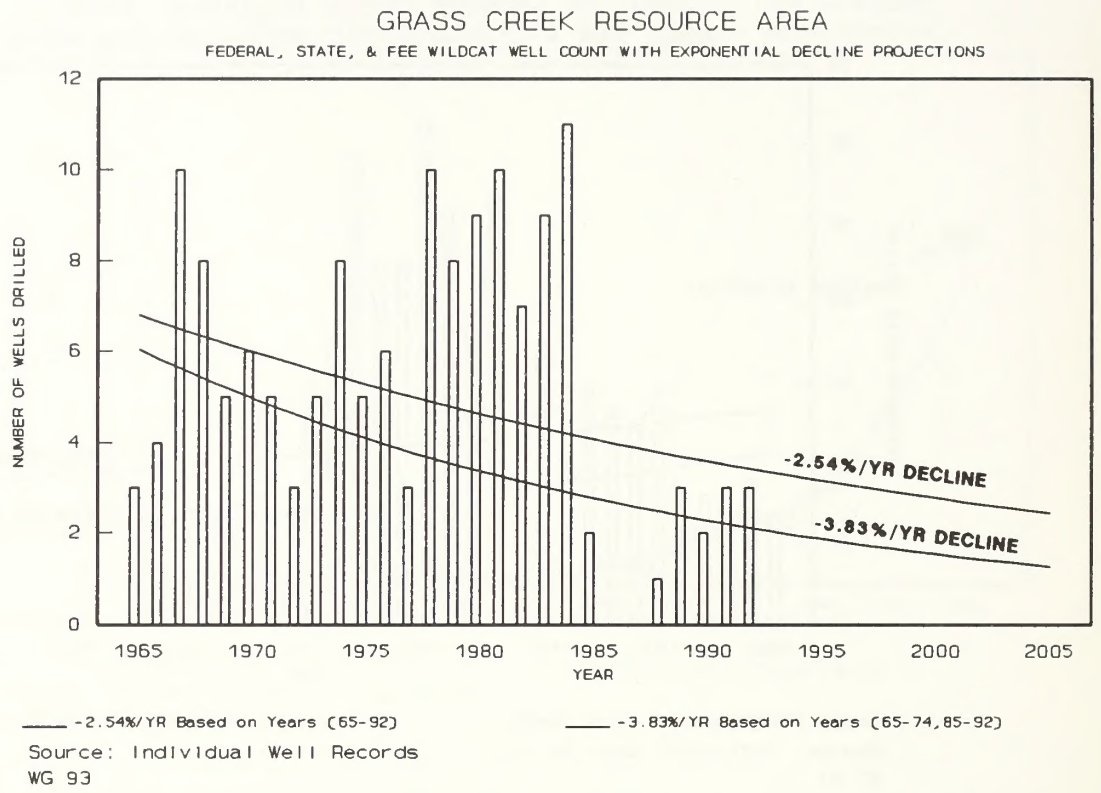
Historic Gas production for the state of Wyoming with least squares exponential decline curve fit and projection.

FIGURE 4-6



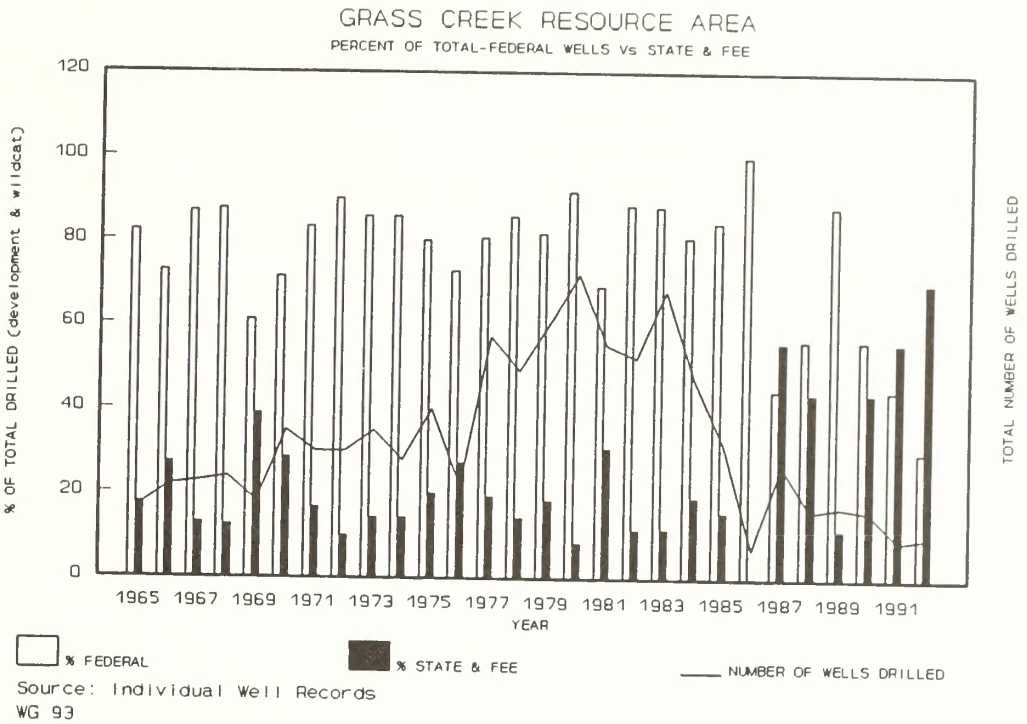
The number of development wells drilled in the Grass Creek planning area per year and the least squares exponential decline curve fits over specified years with projections, expected decline is approximately minus 2 percent (-2.07 percent) per year, as based on non"boom" years.

FIGURE 4-7



The number of wildcat wells drilled in the Grass Creek planning area per year and the least squares exponential decline curve fits over specified years with projections. Expected decline is approximately minus 4 percent (-3.83 percent) per year, as based on non"boom" years.

FIGURE 4-8



Relative proportion of drilling activity for the Grass Creek Planning area, showing the percentage drilled on federal mineral estate as compared to percentage drilled on state and private mineral estates combined. Also shown in the total number of wells drilled per year for all mineral estates.

TABLE 4-5
GRASS CREEK PLANNING AREA EXPLORATORY WELL SUCCESS RATE
(1965 Through 1992)

Play	Discoveries Resulting in a New Field	Dry Holes	Total Wells Drilled	Percentage of Total Wells in the Planning Area	Success Rate
Basin-Margin Anticline	5	70	75	50.34%	1 in 15.00
Basin-Center Gas	3	36	39	26.17%	1 in 13.00
Sub-Absaroka	1	20	21	14.09%	1 in 21.00
Deep-Basin Structural	2	12	14	9.40%	1 in 7.00
Total	**11**	**138**	**149**	**100.00%**	**1 in 13.55**

Source: Individual Well Records

Estimate of Future Development and Exploration

It is anticipated that development and exploration drilling within the planning area would continue along the trends established during the past 20 to 25 years.

The average number of producing gas and oil wells during 1971 through 1991 was 812 on all lands in the planning area. The overall trend for this period was a 1.74 percent per year increase leading to an estimated average (total number of wells predicted by curve fit/16 yrs) of 1,080 producing wells for any given year. The actual number of producing wells would likely be between these two extremes, with the actual number being closer to the average figure of 812 wells. The number of active wells, which includes water disposal and injection wells, would most likely reflect the numbers of producing wells and remain near the present number of 1,200 wells in the planning area. The anticipated constant numbers of both the producing and the active wells is engendered by the mature nature of the Bighorn Basin gas and oil province.

Gas production is increasing at about 5.87 percent per year, based on planning area production during 1977 through 1992, and reflected in a statewide increase based on data for years 1918 through 1992. This production increase is expected to continue over the analysis period resulting in a cumulative production of 183 billion cubic feet of gas, or a yearly average of about 12.2 billion cubic feet from all lands in the planning area. Past oil production, based on data which reflects the statewide trend (during 1971 through 1992), indicates a decline of about 2.74 percent per year. This trend is expected to continue with cumulative production over the analysis period (1991 through 2005) estimated at about 110 million barrels of oil or an average of about 7.3 million barrels of oil per year.

Drilling of production and wildcat wells would continue along established trends as indicated by Individual Well Records. The number of production wells to be drilled over the planning period would continue to decline at a rate of about 2.07 percent per year, reflecting the more conservative decline estimate based only on the non-boom years. This rate and associated curve leads to an estimate of 130 new wells drilled during 1991 through the 2005 planning period, or an average of about 8.6 production wells per year in the planning area. Projecting the decline rate of 3.83 percent per year, the more conservative decline rate estimate based on the non-boom years for wildcat drilling results in a prediction of 28 wildcat wells to be drilled from 1991 through 2005, or an average of 2 (1.86) wildcats per year on all lands in the planning area.

Of wildcat wells drilled the bulk would continue to be in the prolific Basin-Margin Anticline play with increasing interest in the more successful (higher success ratio) Basin-Center Gas and the Deep-Basin Structure plays. Projections of past trends suggest that of the projected 28 wildcat wells, 51 percent would be drilled in the Basin-Margin Anticline Play; 25 percent in the Basin-Center Gas Play; 14 percent in the Sub-Absaroka Play, and 10 percent in the Deep-Basin Structure Play. These wildcats would result in a success ratio comparable to past results of about 7.38 percent, indicating that during the analysis period the drilling of 28 wildcats should lead to the discovery of two fields.

The proportion of wells drilled on federal mineral estate is somewhat enigmatic. Projections of the overall percentage for the 28 year period 1965 through 1992, suggest that federal percentage should remain around 79.7 percent, reflecting the preponderance of federal mineral estate within the planning area. During 1987, the marked change of the percentage of the wells drilled that are on federal mineral estate from 82 percent to 55 percent and the relative consistency and stability of the numbers suggest that the trend of a 55 percent federal might continue. Consequently, of the estimated 130 development and the 28 wildcats to be drilled over the planning period a tentative projection of 100 development and 15 wildcats would likely be on federal mineral estate.

Estimate of New Development in Case of Discovery

New field discoveries in the planning area are expected to be of relatively modest size (one million barrels of oil equivalent or less). The best available models would be the Aspen Creek or Boulder Gulch fields for a discovery in the Sub-Absaroka or the Basin-Margin Anticline Play, and the Seller's Draw or Fairview fields in the Basin-Center Gas Play. The Basin-Center Gas Play is not well-explored, however, and there is a small potential for a gas discovery significantly larger than these predictive models. On the other hand, there is little or no potential for large new discoveries in the Sub-Absaroka, Basin-Margin Anticlinal, Deep-Basin Structure, or Phosphoria plays within the planning area. The potential of the Basin-Margin Subthrust Play is highly speculative and useful field size predictions cannot be made.

Coal Bed Methane and Horizontal Drilling

Coal-bearing formations occur in the planning area which may have potential for coal bed methane development. However, because the coal seams are thin, discontinuous and limited in areal extent the contribution of coal bed methane to the overall gas production is not expected to be significant. No coal bed methane production has been established, to date, within the planning area or the Bighorn Basin

Horizontal drilling is a new technology which can increase the production per well bore in certain types of reservoirs. The prospects for horizontal drilling in the planning area are limited because most of the existing fields are already well-developed.

GLOSSARY

Active Preference: The currently authorized livestock grazing use on public lands in an allotment, measured in animal unit months (AUMs) of forage.

Actual Use: The total grazing use estimated to have taken place, measured in animal unit months (AUMs) of forage annually.

Allotment Categorization: The grouping of livestock grazing allotments into the categories "M" (maintain current condition), "I" (improve current condition), and "C" (manage custodially while protecting existing resource values). The criteria that determine the allotment categorization are described in Appendix G.

Allotment: An area of land designated and managed for livestock grazing. An allotment may include intermingled private, state, public, and other federally-administered lands that are administered for grazing.

Animal Unit Month (AUM): The amount of forage needed to sustain one cow and calf pair, five sheep, or one horse for one month.

Anticline: A dome-like geologic structure comprised of folded rocks that may contain gas and oil.

Carrying Capacity: The maximum level of grazing that can be sustained without damage to the range.

Category 2C Species: A species of plant or animal showing evidence of survival vulnerability, in which the evidence of vulnerability is not sufficient to support listing of the plant or animal as threatened or endangered.

Composition: The percentages of various plant species in a plant community.

Cover: The material covering the soil and providing protection from, or resistance to, the impact of raindrops and the energy of water flowing over the surface of the land; expressed in percent of the area covered. Cover is composed of vegetation, plant litter, and rocks.

Crucial Winter Range: Winter habitat on which a wildlife species depends for survival. Because of severe weather conditions or other limiting factors, no alternative habitat would be available.

Desired Plant Community: A plant community which meets resource management plan objectives.

Disruptive (or Human-Presence Disturbance) Activities: The physical presence, sounds, and movements of people and their activities (on, below, or above the land surface) whether on foot, riding animals, or using mechanized or motorized vehicles or equipment.

The bulk of the concern for mitigation of disruptive activities is associated with the effects of human presence and activity on wildlife. That is, the effect that human presence, movements and sounds (including those of the equipment used) may have on the well-being of wildlife during critical life-cycle stages (breeding, nesting, birthing), or during periods of severe weather conditions (severe winter storms, long periods of severe cold or deep snow conditions), when forage or habitat are severely limited, and when the animals are under high stress and depleted body-energy conditions.

Harassment of wildlife from human presence, movements, or sounds during these kinds of periods and conditions can cause excessive and unnecessary impacts, including mortality, fetal abortion, and abandonment of young. While these types of activities can be associated with the performance of surface-disturbing activities, they are not exclusive to that.

Disruptive activities can also be associated with effects to other resources, such as excessive or adverse influences and effects of human presence or modern society's imprint on areas of highly primitive, seclusive, scenic, or historic value.

Diversity: The relative abundance of wildlife species, plant species, plant communities, and habitats in an area.

Forage: Browse and herbaceous foods that are available to grazing animals.

Forb: A flowering plant whose aboveground stem does not become woody and is not grass or grasslike.

Full Suppression: A strategy for extinguishing fires that requires immediate and continuous aggressive attack in the most cost-effective manner, with the least amount of property damage or resources lost. Full suppression may include control, containment, or confinement of a wildfire to meet land management objectives.

Functional-At-Risk: Riparian/wetland condition is functional, but soil, water, and/or vegetative factors make the area susceptible to degradation.

Grazing Preference: The total number of animal unit months (AUMs) of livestock grazing on public lands apportioned and attached to base property owned or controlled by a permittee or lessee.

Interdisciplinary: Characterized by participation or cooperation among two or more disciplines or fields of study.

Key Area: A relatively small portion of rangeland selected because of its location, use, or grazing value as an area on which to monitor the effects of grazing.

Key Species: Forage species of particular importance in the plant community or which are important because of their value as indicators of change in the community.

Limited Suppression: A fire strategy used when full control of a fire is extremely difficult or when resource values do not warrant the expense associated with full suppression.

Monitoring: The orderly collection, analysis, and interpretation of resource data to evaluate progress toward meeting resource management objectives.

Nonattainment Area: A geographical area in which the mean concentration of specific criteria pollutants exceeds the national ambient air quality stands. Prevention of Significant Deterioration (PSD) regulations do not apply in nonattainment areas.

No Surface Occupancy (NSO): The term "no surface occupancy" (NSO) is used in two ways. It is used in one way to define a **no surface occupancy area** where no surface-disturbing activities, *of any nature or for any purpose*, would be allowed. For example, construction or the permanent or long-term placement of structures or other facilities for any purpose would be prohibited in an NSO area.

The other way the "no surface occupancy" term is used is as a stipulation or mitigation requirement for controlling or prohibiting selected land uses or activities that would conflict with other activities, uses, or values in a given area. When used in this way the NSO **stipulation or mitigation requirement** is applied to prohibit one or more specific types of land and resource development activities or surface uses in an area, while other—perhaps even similar—types of activities or uses (for other purposes) would be allowed. For example: Protecting important rock art relics from destruction may require closing the area to the staking of mining claims and surface mining, off-road vehicle travel, construction or long-term placement of structures or pipelines, power lines, general purpose roads, and livestock grazing. Conversely, the construction of fences to protect the rock art from vandalism or from trampling or breakage by livestock, an access road or trail, and other visitor facilities to provide interpretation and opportunity for public

enjoyment of the rock art would be allowed. Further, if there were potential and interest for leasing and development of leasable minerals in the area, leases for gas and oil, coal, and so forth, could be issued with a "no surface occupancy" stipulation or mitigation requirement for the rock art site, which would still allow access to the leasable minerals from adjacent lands and underground.

The term "no surface occupancy" has no relationship or relevance to the presence of people in an area.

Notice: Notification, in the form of a letter, submitted by a mining claim operator to the BLM, for operations that will cause a cumulative surface disturbance of 5 acres or less during any calendar year. This notification must be made at least 15 calendar days before the operations begin. Approval of a notice by the BLM is not required.

Off-Road Vehicle: Any motorized vehicle capable of, or designed for, travel on or immediately over land, water, or other natural terrain, excluding: (1) any nonamphibious registered motorboat; (2) any military, fire, emergency, or law enforcement vehicle while being used for emergency purposes; (3) any vehicle whose use is expressly authorized by the authorized officer, or otherwise officially approved; (4) vehicles in official use; and (5) any combat or combat support vehicle when used in times of national defense emergencies. (43 CFR 8340.0-5)

Percent Public Land: The percentage of public land use determined by the proportion of livestock forage available on public land within the allotment compared to the total amount available from both public lands and those owned or controlled by the permittee or lessee. (43 CFR 4130.6-2(g))

Percent Suitable: The percentage of an allotment where forage is available to cattle during the summer based on location of water, steepness of slope, and vegetation production.

Potential Natural Community: The community that would become established if all successional sequences were completed without interferences by man under the present environmental conditions. This term is synonymous with climax community.

Prescribed Fire: Application of fire (by planned or unplanned ignition) to wildland fuels in either their natural or modified state, under specified conditions to allow the fire to burn in a predetermined area while producing the fire behavior required to achieve certain management objectives.

Prevention of Significant Deterioration (PSD): The process incorporated in the Clean Air Act which places emission limitation son specified new or modified sources. PSD regulations are intended to limit deterioration of air quality that is currently cleaner than national ambient air quality standards.

Production: The weight of forage that is produced on a given area within a designated period of time.

Proper Functioning Condition: Riparian-wetland areas are functioning properly when adequate vegetation, land form, or large weedy debris, is present to dissipate stream energy associated with high water flows, thereby reducing erosion and improving water quality; filter sediment, capture bedload and aid floodplain development; improve floodwater retention and groundwater recharge; develop root masses that stabilize streambanks against cutting action; develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl, breeding, and other uses; and support greater biodiversity. The functioning condition of riparian-wetland areas is a result of interaction among geology, soil, water and vegetation.

Range Condition: The existing state of range vegetation in an area described in comparison to the climax (natural potential) plant community for that area. It is an expression of the relative degree to which the kinds, proportions, and amounts of plants in a plant community resemble that of the climax plant community. Range condition is rated as: potential natural—more than 75 percent of the vegetation is in a climax state, late seral—51 to 75 percent of the vegetation is "climax", mid seral—26 to 50 percent is climax, and early seral—less than 26 percent of the vegetation is climax.

Range Site: A distinctive geographical unit that differs from other kinds of geographic units in its ability to produce a characteristic natural plant community. A range site is capable of supporting a plant community that differs from other communities in the kinds or percentages of plant species or in total vegetative production by the community.

Range Improvement: A structure or land treatment intended to facilitate the management of range or livestock on the range.

Rangeland Vegetation Inventory: Includes the data collected from range site condition mapping.

Recommended Stocking Level: The level of livestock use measured in animal unit months (AUMs), recommended in the technical guides produced by the Soil Conservation Service. This recommended level is based on the productivity of individual areas called "range sites" and adjusted by the range condition.

Recreation Opportunity Spectrum: A continuum used to characterize recreation opportunities in terms of setting, activity, and experience opportunities. Four of six total classes are represented on BLM-administered public lands in the planning area. These are *semiprimitive nonmotorized, semiprimitive motorized, roaded natural,* and *rural.*

Rest-Rotation: A prescribed pattern of grazing use that provides sequential rest for various parts of the range unit for at least one year.

Riparian Habitat: Common usage refers to the green zones along the banks of streams and ponds and such wetlands as springs or wet meadows. Other usage defines it as any area characterized by vegetation dependent upon more water than is available to normal upland vegetation. The BLM's usage is "an area of land directly influenced by permanent water. It has visible vegetation or physical characteristics reflective of permanent water influence. Lakeshores and streambanks are typical riparian areas. Excluded are such sites as ephemeral streams or washes that do not exhibit the presence of vegetation dependent upon free water in the soil." See also Wetlands, Jurisdictional Wetlands.

Roaded Natural: One of the six classes of the *recreation opportunity spectrum.* Roaded natural areas offer about equal recreational opportunities for affiliation with other user groups or isolation from sights and sounds of human activities. Such areas provide the opportunity for visitors to have a high degree of interaction with the natural environment. Challenge and risk opportunities are not very important except in specific challenging activities. The practice of outdoor skills may be important. Opportunities for both motorized and nonmotorized recreation are present.

Rural: One of the six classes of the *recreation opportunity spectrum.* In rural areas, opportunities to experience recreation in affiliation with individuals and groups are prevalent, as is the convenience of recreation sites. These factors generally are more important than the natural setting. Opportunities for wildland challenges, risk taking, and testing of outdoor skills are unimportant except in activities involving challenge and risk.

Season of Use: The part of the year in which livestock are authorized to graze in a given year.

Semiprimitive Motorized: One of the six classes of the *recreation opportunity spectrum*. Semiprimitive motorized areas offer some opportunities for isolation from the sights and sounds of human activities, but not as much as with opportunities for semiprimitive nonmotorized recreation. Use of these areas involves the opportunity for visitors to have a high degree of interaction with the natural environment, to have moderate challenge and risk, and to use outdoor skills. Such an area provides an explicit opportunity to use motorized equipment while in the area.

Semiprimitive nonmotorized: One of the six classes of the *recreation opportunity spectrum*. Semiprimitive nonmotorized areas offer opportunities for isolation from the sights and sounds of human activities, but not as much as with opportunities for primitive recreation. Use of these areas involves the opportunity for visitors to have a high degree of interaction with the natural environment, to have moderate challenge and risk, and to use outdoor skills.

Seral Stage: The present state of vegetation of a range site in relation to the potential natural community for the site. Vegetation status is the expression of the relative degree to which the kinds, proportions, and amounts of plants in a community resemble those of the potential natural community. The classes are potential natural community, late seral, mid-seral, and early seral.

Suitable Animal Unit Months (AUMs): The number of animal unit months (AUMs) of forage available based on the percentage of an allotment that is suitable for cattle grazing during the summer.

Surface-Disturbing Activities (or Surface Disturbance): The physical disturbance and movement or removal of the land surface and vegetation. It ranges from the very minimal to the maximum types of surface disturbance associated with such things as off-road vehicle travel or use of mechanized, rubber-tired, or tracked equipment and vehicles; some timber cutting and forest silvicultural practices; excavation and development activities associated with use of heavy equipment for road, pipeline, power line and other types of construction; blasting; strip, pit and underground mining and related activities, including ancillary facility construction; gas and oil well drilling and field construction or development and related activities; range improvement project construction; and recreation site construction.

Mitigation of surface-disturbing activities centers around surface reclamation and the control and prohibition of surface uses. Mitigation is associated with concerns for such things as movement of disturbed or denuded soil (by water, air, or gravity); erosion; water quality (sedimentation, salinity, pollution); wildlife habitat (vegetative and spacial, aquatic or terrestrial); vegetative composition, cover or productive capacity (quality, quantity) for consumptive and nonconsumptive uses (grazing, scenic values, watershed stability); surface and subsurface cultural and paleontological values; and other subsurface values (cave or karst systems, aquifers).

Suspended Preference: Part of the grazing preference which is temporarily withheld from the currently authorized (active) grazing use, measured in animal unit months (AUMs) of forage.

Total Authorized Grazing Use: The maximum amount of grazing that could take place in an allotment under the terms and conditions of a grazing permit. This use would involve all types of landownership within an allotment where the lands are managed-in-common.

Trend: The direction of change in the condition or health of the range, usually gauged in relation to its natural potential and determined by observation over a period of time.

Utilization: The percentage of forage that has been consumed or destroyed by during a specific period.

Wetland: Defined by the U.S. Fish and Wildlife Service as "areas inundated or saturated by surface or ground water at a frequency and duration sufficient to support and which, under normal circumstances, do support a prevalence of vegetation typically adapted for life in saturated soil conditions." The BLM's usage is virtually synonymous with riparian area, but includes associated waters such as ponds or streams, and all other wet areas such as springs, wet meadows, bogs, swamps, and sloughs.

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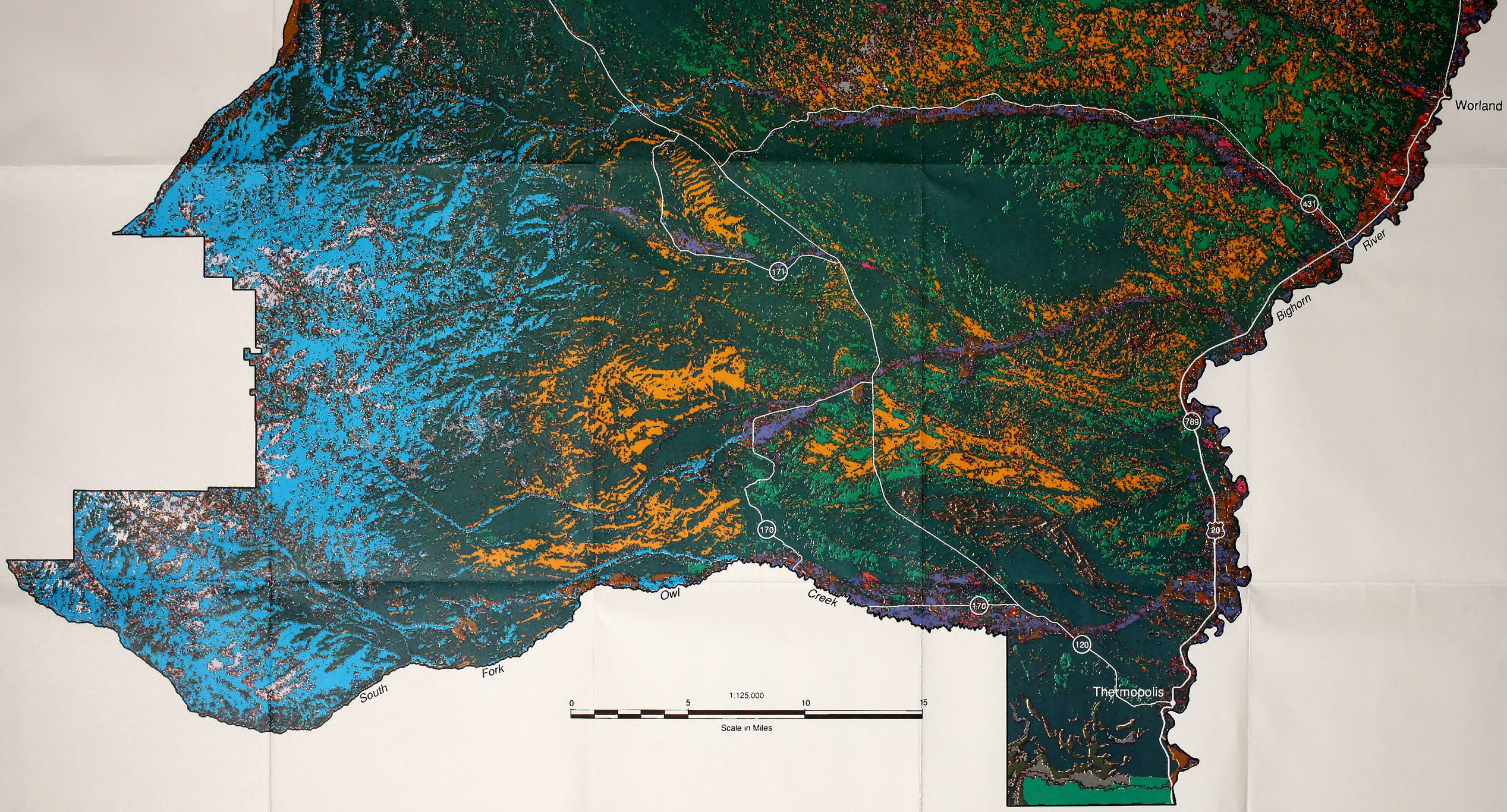
Map A
Vegetation

Map A
Vegetation


Worland
431
Bighorn
River
171
789
20
170
Owl
Creek
170
120
Thermopolis
South
Fork
1:125,000
0
5
10
15
Scale in Miles

Map B
Landownership Status and Grazing Allotments

- Lands Administered by Bureau of Land Management
- Lands Administered by Bureau of Reclamation
- Lands Administered by National Forest Service
- Lands Administered by State of Wyoming
- Privately Owned Lands
- Grazing Allotment Boundary
- 0508 Grazing Allotment Number
- Unallotted Area

N

Meeteetse
Greybull River
Big Horn River
Bighorn River
Gooseberry Creek
Owl Creek
South Fork
Smile Creek
Big Horn County
Washakie County
Park County
Hot Springs County
Worland
Thermopolis
Basin

T 50 N
T 49 N
T 48 N
T 47 N
T 46 N
T 45 N
T 44 N
T 42 N

R 100 W
R 99 W
R 98 W
R 97 W
R 96W
R 95 W
R 94 W
R 93 W

0 5 10 15
Scale in Miles

Map C
Mineral Ownership Status

- Federal Coal
- Federal Coal, Gas and Oil
- Federal Gas and Oil
- Other Federal Minerals
- Federal Phosphate
- All Federal Minerals
- Private or State Owned Minerals

N

Basin
Meeteetse
Worland
Thermopolis
Big Horn County
Washakie County
Park County
Hot Springs County

Greybull River
Fifteenmile Creek
Wood River
Gooseberry Creek
Grass Creek
Enos Creek
Prospect Creek
Cottonwood Creek
North Fork South Owl Creek
Owl Creek
Bighorn River

T 51 N
T 50 N
T 49 N
T 48 N
T 47 N
T 46 N
T 45 N
T 44 N
T 43 N
T 42 N

R 100 W
R 99 W
R 98 W
R 97 W
R 96W
R 95 W
R 94 W
R 93 W

16
20
30
120
230
431
170
789

0 5 10 15
Scale in Miles